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CAR DRIVER

SEPTEMBER 2015

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2016's NEW CARS

PLUS: THE BATTLE FOR YOUR DASHBOARD

APPLE CARPLAY
VS. ANDROID AUTO

THE MOST EPIC ENGINE OF THE YEAR

FORD MUSTANG

GT350

WITH

SIX-WAY SMALL-CROSSOVER
COMPARISON TEST
FERRARI 488GTB FIRST DRIVE
640-HP CADILLAC CTS-V,
NEW NISSAN MAXIMA FLOGGED!

THE TALE OF THE
2016 EQUINOX

AS TOLD FROM THE SAFETY OF THE DRIVER'S SEAT.

We sat down with engineer and all-around safety whiz Dennis Kazensky and seating guru Doug Bertoia to talk about safety technology and smart seating that not only helps keep us safer, but also more comfortable.



Preproduction model shown. Actual production model may vary. Available Fall 2015.



DENNIS KAZENSKY

CHEVROLET GLOBAL SYSTEMS LEAD
ACTIVE SAFETY ENGINEER

Do you think available active safety features are helping drivers become more aware on the road?

Absolutely. In fact, we design our available advanced active safety features to encourage good driving behavior, such as getting drivers to look toward the crash threat. For example, in the 2016 Equinox, we put the new available Side Blind Zone Alert on the exterior side mirrors so drivers can conveniently check for both alerts and approaching traffic outside their blind zones.

How do you determine the best way to alert the driver?

Alert design depends on several factors, including how often an alert occurs, the urgency of the crash situation and driver acceptance. For example, the Side Blind Zone Alert, offered in the 2016 Equinox, is visual only because drivers commonly experience

blind spot threats when they're already monitoring the road for that situation. On the other hand, we designed the available Rear Cross Traffic Alert in the 2016 Equinox to be more attention-getting — since these situations are less frequent and may not even be visible to the driver in crowded parking situations or driveways with side obstructions. So if crossing traffic is detected when backing up, left- or right-side audible alerts are presented to let the driver know where the traffic is coming from. In addition, red caution triangles with directional arrows appear on the rear vision camera screen so the driver can easily check what is going on behind them. We conduct careful research with drivers before preparing features for production, which is paying off, as consumer surveys indicate owners love these features.

“We design our available advanced active safety features to encourage good driving behavior.”

Dennis Kazensky

CHEVROLET GLOBAL SYSTEMS LEAD — ACTIVE SAFETY ENGINEER



DOUG BERTOIA

CHEVROLET TECHNICAL LEAD
SEAT SYSTEMS ENGINEER

How did you design the Multi-Flex® sliding rear seat and what were some of the challenges?

Equinox introduced the Multi-Flex sliding rear seat to adapt to a wide variety of different cargo and passenger needs. It definitely had its challenges when it was developed. We weren't able to utilize the center rail that attaches the seat to the underbody structure and supports the passenger weight because it would interfere with the seat's sliding functionality. In order to execute a full-width cushion with the forward and rear sliding feature, we had to manage the weight of the occupants through the seat structure without the center rail. We solved this by distributing the load to the outer sides of the seat.

What materials do you use when designing a seat and how do you test them?

Engineering a vehicle seat requires us to test a wide range of materials: the urethane foams that you sit on, various metals, electrical components and safety belt pretensioners, to name a few. Soft materials, like foam, have traditionally been very challenging to test. However, with the help of a new technology, Finite Element Analysis, we can now digitally simulate soft materials to help design seats that are structurally supportive and comfortable. It's exciting to be able to apply groundbreaking technology to help us engineer the seats of the future.



Safety features are no substitute for the driver's responsibility to operate the vehicle in a safe manner. The driver should remain attentive to traffic, surroundings and road conditions at all times. Read the vehicle Owner's Manual for more important safety information.

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photography by
Roy Ritchie



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LIGHTNING LAP ISSUE!
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WHAT I'D DO DIFFERENTLY

John Krafcik.

There's even more to love about Subaru.



When we win, you win. Kelley Blue Book named Subaru the Most Trusted Brand, Lowest Cost to Own, and Best Resale Value for 2015.* All that blue can really help you save some green. **Love. It's what makes a Subaru, a Subaru.**



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★ WRAPPING PAPER

So was I the only person anal enough to notice that you had the same car on the front and back covers of the June issue?

SAL

GENEVA, ILLINOIS

The only person? Yes. The only cat? No—Ed.

CALLING 911

You guys must drive your cars hard. You got 13 mpg in your Porsche 911 Carrera GTS on a 275-mile trip [“The Imitation Game,” June 2015]. I live on the Oregon coast and drive in to Portland once a week. I can’t go very fast because there are too many deer and elk wandering around, but I have found that even going over a 1600-foot pass and averaging 60 mph, I get 28 mpg in my 2013 911 Carrera S. On a level highway at the same speed, I get 34 mpg.

JON ORLOFF

ROCKAWAY BEACH, OREGON

The picture on pages 44 and 45 of the June issue captures perfectly why I want your job. And I fly fighter jets for a living.

CHRIS BOYLE

VIRGINIA BEACH, VIRGINIA

A pay stub may convince you otherwise—Ed.

Lately *C/D* is filled with exotics that cost \$150,000 or more. They’re interesting but not what I expect. Please stick to what you do best. That is, test vehicles that the masses would buy and give your readers unbiased reports based

on your professional expertise. Stick to that and you’ll have me for 60 more years.

TOM BAUMANN

EL PASO, TEXAS

Out in the west Texas town of El Paso...

A cowboy named Tom had a problem with Ed.

Tom wrote a letter and sent it our way.

Ed. ran the letter, the one you just read—Ed.

Great test guys, but for the \$110K–\$150K as-tested price tags of your three rivals, I can buy a lot of very gently used Aston Martin Vantages. Three- to five-year-old examples typically show less than 15,000 miles. It might even have a V-12, and it certainly will have an honest-to-goodness manual transmission. Best of all, almost no one will know what it is.

BRUCE BASTIAN

FORT COLLINS, COLORADO

Can you please elaborate upon the page-48 picture caption that references a \$9900 paint job on the AMG GT S? I hope that is part of an exclusive trim/option level that includes more than paint. I can paint a car, but I can’t make functional carbon-ceramic brakes, which go for roughly the same amount.

WAZE AND MEANS

Ezra Dyer’s June feature on Waze is a classic [“Catch Me if You Can”]. “If we do see a cop, we all know who’s taking the fall, and it ain’t the lady in the ’96 Century.” I deleted the app, because I generally drive alone and it’s too distracting minus a passenger’s help. Don’t Waze me, bro!

JEFF SAWYER

FRANCONIA, NEW HAMPSHIRE

For more Waze letters, see next page.

Though, faced with the choice of buying a new Nissan Versa or a Mitsubishi Mirage, pitted against however many buckets of paint it took to coat the Benz... the paint starts to look like a pretty good deal.

KYLE ZICKERT

MINNEAPOLIS, MINNESOTA

Car and Driver is the car mag that I enjoy the most. Having said that, your critique of the Jaguar F-type R gave me pause. I



THE CODE



Car and Driver has partnered with Ford to bring you The Code, an editorial program inspired by the all-new 2015 Ford F-150, and the men who drive them. From the skills every man should have and the latest in gear to smart news and entertainment, The Code brings the spirit of “Built Ford Tough” to life.

RUNNING THE MOJAVE ROAD

Even today, the Wild West is striped with dirt roads—but none is as epic, as iconic, as the Mojave Road, a.k.a. the Mojave Trail, a 166-mile ribbon of dirt and sand that crosses California’s Mojave Desert. Originally an Indian trade route, then a wagon trail, this world famous road has been in use by humans for hundreds of years. Fortunately for those with four-wheel-drive and a craving for adventure, the road part of California’s vast, 1.3 million acre Mojave National Preserve is wide open to anyone with a street legal vehicle who’s looking to truly get off the beaten path. Tag along as we take the long and scenic route from Las Vegas to L.A., across some of the most pristine and spectacular landscapes in America—then print out a map and do it yourself.

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RULES OF THE ROAD



GAS STOPS

Fuel stops should only be taken at minimart-integrated stations that are visible from the highway. Each passenger must purchase one scratch-it per trip leg—all winnings go towards a group dinner at end destination.



CO-PILOT DUTIES

Co-pilot must remain awake at all times and be able to navigate, adjust the stereo/tunes, hand food to the driver and psycho-analyze late night ramblings.



3-STRIKE STEREO RULE

Each passenger gets one opportunity to DJ per half day. A warning is given for first song skip request. After three, audio privileges are revoked until the following day.



REST STOPS

No rest stop breaks before the 100-mile mark in the trip. (Exception can be made for the presence of blood.) A request to stop prior to the initial mileage achievement will result in a “picking up lunch” penalty.



TOOT-TOOT

Any passenger (over the age of 15) who earns an air-horn blast via an arm gesture has to buy everyone a snack at the next stop. Anyone who causes a window to be cracked as a result of their own air-blast, pays for gas at the next fuel stop. Grow up.

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012
09.2015

. backfires



must admit that I am not a fan of German cars under any circumstances, but to suggest that one of the most beautifully sculpted sports cars is a “packaging disaster” is ridiculous. I am a 6-foot-1-inch former Navy fighter pilot, and to suggest that the car is crude is just wrong, as is ranking it a distant third to the Germans. The interior, albeit compact, is ideal for a performance car that has real “attitude” (fighter-jet compact—as it should be). I have a 2015 Jaguar F-type R coupe and a 2015 Chevy Corvette Stingray Z51. They are very different performance machines in many great ways. For my money they are the epitome of what sports cars should be (cost/value and fun to drive).

RON SPOLTORE

LOS ANGELES, CALIFORNIA

I can't believe that both Goose and Maverick wrote in this month—Ed.

I've been reading C/D for three years now. I find it highly annoying how the Porsche

911 must win every comparo. For example, the Mercedes-AMG GT S accelerates from zero to 60 in 3.0 seconds. That's 0.6 second quicker than the Porsche 911 Carrera GTS. Also, the AMG's top speed was 4 mph higher, while having a quicker quarter-mile time. I am starting to find you guys biased. Please give a better reason that the 911 is better besides the fact that it's “more agile.”

JONATHAN BRULL

ROYERSFORD, PENNSYLVANIA

If you've really been reading C/D for the past three years, you'd know that a 911 has lost to a BMW M4 and a Corvette Z51—Ed.

V DAY

When the ATS first came out in 2013, I was almost first in line [“Lone Star,” June 2015]. I grew up in a Cadillac family, and the ATS turned out to be quite a driver's dream, even with the standard four-cylinder engine. I get an average of 27.5 mpg, and the comfort is second to none. But, that damn CUE system! I've noticed in almost all reviews of any Cadillac that the writers bitch about the CUE system. After three years, you would think that the honchos at Cadillac would get the message. I had to laugh at the fist pounding and cussing that you detailed in the latest road test in your June issue. I traded in a Hyundai Sonata that had a far superior nav system. Does anyone in Detroit, now New York, listen? I finally gave up and put in a Garmin.

JIM HILDEBRAND

SPRING HILL, FLORIDA

See page 048, Jim—Ed.

On page 39 of the June issue at the top, you list the base price of the ATS-V as \$63,660. Yet in your graph in the bottom where you compare the ATS-V with its competitors, you indicate that the base price is about \$66,000. What gives?

LB

OAK PARK, MICHIGAN

To achieve the performance reported in the graphs, you'll need a few performance-enhancing options. As noted, the bar-graph base prices include that equipment—Ed.

CR-V BABY

There's an error in the stats page for your Honda HR-V review in the June

issue [“Soul Rebel”]: 117 mph in top gear turned into 17 mph.

DIRK STOOP

MENLO PARK, CALIFORNIA

What, are you a fighter pilot or something?—Ed.

MORE WAZE AND MEANS

Enjoyed the insightful article from Ezra Dyer on beating the fuzz with Waze technology. Ezra needs to visit Arizona and I-17 southbound on Sunday afternoon to see more “wide-scale civil disobedience.” Sun-baked Phoenicians create a 100-mph bumper-to-bumper “train” in the left lane all the way down the 100-mile hill from Flagstaff. Advice for driving southbound I-17: Sit down, shut up, and hang on!

RICHARD MAYOL

FLAGSTAFF, ARIZONA

Don't you mean “I-117”?—Ed.

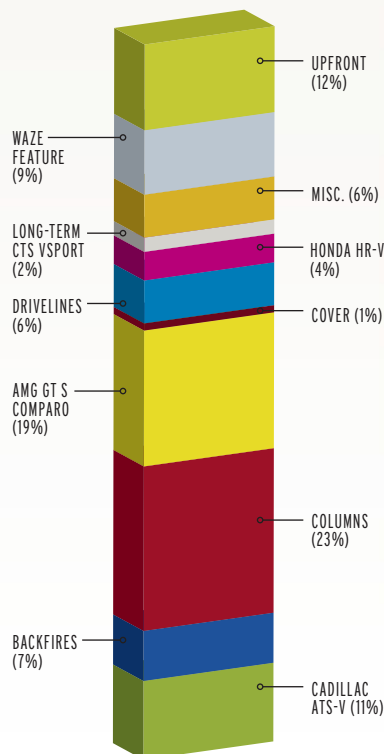
I anxiously read the article on Waze since I am Johnny Law, Five-O, Super Trooper, and on and on. First off, if your screen name is DrewPBallz, drive like you have some. The troopers you saw were probably wondering why a McLaren was driving the same speed as soccer moms in minivans. Yes, you hit 99 mph, but it was in a McLaren. This is barely off pace on Alligator Alley. Not that I am condoning speeding. Second, we cops are tech savvy at times as well. We run the app and delete the police icons as we cruise through the area. It works especially well in a sweet unmarked Charger. The best way to know where Five-O is located is to go a bit more old school. Billy Big Rig does a better job of pointing us out than hipsters in skinny jeans with a silly app. Your McLaren would look sweet with a big Wilson 1000 CB antenna on it. Nevertheless, it was an enjoyable article to read, imagining you squealing with excitement as you cautiously drove past troopers. Just know they were wondering why a hipster in a McLaren was driving a supercar like it was a Dodge Caravan! Enjoy soccer practice.

TED

GRANGER, INDIANA

Ezra, you're an idiot. Play your silly games at speeds well in excess of posted limits

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so you have an article to write. Never mind the law or the innocent people whose lives you put at risk. No, by all means, play your childish games. Really, don't you have better things to do?

R. GIACONE

ROCKVILLE CENTRE, NEW YORK

But Giaccone, Officer Ted thinks we went too slowly—Ed.

wheels on my 2013 Scion. \$300 per wheel from a brand that never seems to cut corners is a spankin' deal!

BRANDON R.

MIDDLETOWN, NEW YORK

Upgrading from 18- to 19-inch wheels costs that much. You don't get a set of 18- and 19-inch wheels as part of the deal—Ed.

FAMILY CREST

As usual, although showing engineering promise, Cadillac has been producing some of the ugliest cars on the planet ["So Long, Detroit," June 2015]. That's why fewer and fewer buyers are purchasing the CTS. Why don't the forces at Cadillac hire Pininfarina and put something beautiful in its lineup?

TONY ATERNO
AUSTIN, TEXAS

UPGRADE NATION

I noticed in the June issue that on the 2015 BMW M3 test vehicle in the Fleet Files you chose the 19-inch wheels (\$1200) as part of your optional equipment. Can you point me in the direction of the BMW dealer you used? I paid more than that for 18-inch TRD



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FERRARI OPENING

There's a glaring error in the Ferrari California T review [Drivelines, June 2015] that claims the California was "first with a power-retractable hardtop." The 575M Maranello Superamerica variant had a retractable hardtop in 2005!

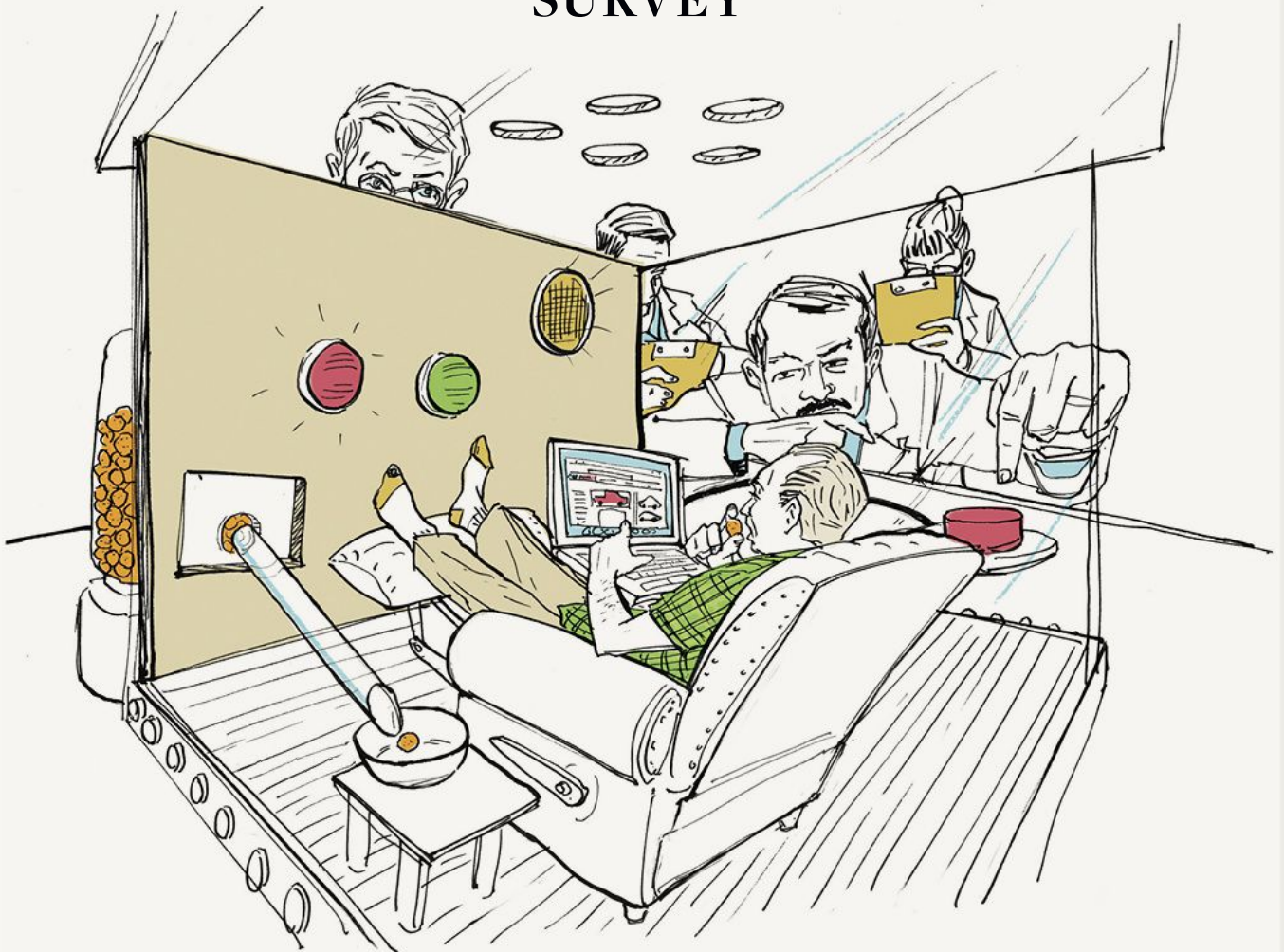
BOBBY BENJAMIN
ONLINE ZONE

Robinson says that was more of a flip top. To which he adds, "Whatever"—Ed.

WHO'S THE MACAN?

Needless to say, after reading your review of the Porsche Macan S [Drivelines, June 2015], I was deeply disturbed. The abomination that is the Cayenne was bad enough, but at least it maintains as many Porsche virtues as an SUV can. Now they've delivered a baby ute with "numb steering," a "mushy brake pedal," and

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backfires

"slight fade." We've seen what happened to BMW after it tumbled down the slippery slope of softer cars for greater sales: It got beaten by a Lexus [June 2013]. When Porsche—beacon of good and righteous driving dynamics—begins to lose its way, we should fear for them. Repent now, Porsche! Repent before the Buick LaCrosse defeats the GT3 in a comparison test!

BRETT SAUVÉ

MINNEAPOLIS, MINNESOTA

RESCUE RANGER

Joe Venturella makes a good case [Backfires, June 2015] for a small truck like the Ford Ranger. There are plenty of us who can use a smaller efficient truck, don't need to haul huge payloads, and who aren't tall. I mention height because the bed walls on all full-size pickups are too high for a lot of us to reach over comfortably, if at all. This reduces the handiness of having an open-bed vehicle. Smaller trucks also fit in garages and the ever-shrinking spaces in parking lots. Ford, you are ignoring a good market, and my 2011 Ranger won't last forever.

STEVE OBERMAN

CARLINVILLE, ILLINOIS

NIGHTMARE WALKING, PSYCHOPATH TALKING

Amen to Jared Gall's "237 Shades of Gray" analysis in June. We agree, where is the color? A BMW dealer, with lots of black and gray, said that is what people want, but it's also all they offer. New-car lots look depressing. That's why we drive a yellow Mini.

BRUCE AND NAN

MENTOR, OHIO

Very interesting piece in the June issue on the most popular car colors. I was shopping for my new car and found that

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dealers only stock white, gray, silver, or black. There are some great color choices being offered, with cool names like Vitamin C, Molten Orange, TorRed, and B5 Blue. Why don't dealers stock any of these great colors? The answer I received was, "We only stock the safe colors we know we'll sell." I ended up driving five hours to buy a Tangerine Scream 2014 Ford Focus ST as it was the only color I considered. I agree with your comment, "C'mon, people."

DAVID BENNETT
HAZEL GREEN, WISCONSIN

Finally, information more useful than the zero-to-60 time of a \$2.5 million supercar. When I read my wife the stat that almost three-quarters of cars sold in 2014 were boring, colorless—white, gray, silver, and black—she responded with those seldom spoken words, "You were right."

TONY MAZUREK
GROSSE ILE TOWNSHIP, MICHIGAN

FJ AND THE BEAR

Superfluous John Phillips, no one gives a damn that your wife bought an FJ Cruiser ["Collecting Toyotas," June 2015]. Please write about something interesting or mildly entertaining. Thanks!

SHEP
PHOENIX, ARIZONA

If John Phillips can come up with a "twin-rotor Sikorsky" he might want to take his local Sasquatch for a ride in it. He is as likely to find the latter as the former.

LYLE THE OBSCURE
VIRGINIA BEACH, VIRGINIA

Phillips has seen Sasquatch twice since moving to Montana. It's not that serious, though; they just had coffee the second time—Ed.

The "Collecting Toyotas" column by John Phillips was great. My wife and I have had multiple cars, mostly Hondas and Infinitis, then we bought our first FJ Cruiser. We ended up trading in our FJ for a 4Runner because we wanted something bigger. The 4Runner was definitely roomier, but not as fun to drive. We traded it in for a new FJ. Then we got a Scion FR-S. We have heavily modified both of them, especially the

LETTER OF THE MONTH

I loved the article about paint colors. My favorite color is road dirt so I wash my cars less often.

LAZY JIM
CINCINNATI, OHIO



FJ. We will never get rid of it. My wife and I always wanted a classic Ford Bronco for a project vehicle, but we have also decided that it will be an old FJ40. Also, my in-laws live with us, and they have both a Tundra and a Tacoma. I work in manufacturing, so I've read all of *The Toyota Way* books, and I can't be more impressed. I'm not saying I'll never buy anything else, but I am definitely collecting Toyotas.

PETER PETERSON
LOS LUNAS, NEW MEXICO

ROLL ON, EZRA

Ezra Dyer brought back memories of my Swedish Sleeper ["Polestar, Paul Newman, and the Rise of the Swedish Sleeper," June 2015]. It was an ordinary mouse-gray Volvo 245 Turbo that Ross Converse heated up with a Ford 302 V-8. It was my most fun car ever. It'd stomp a Mustang or Camaro, and they'd try again! Nothing since, including a CTS-V and three AMGs, even comes close.

ROB KETCHAM
EASTON, MARYLAND



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★ WHY METRO AREAS?

The population of a core city rarely represents a region's full population. A metropolitan area generally consists of one large city and several smaller ones. Detroit's population is about 675,000. The metro area holds 4.3 million.

AN ODE TO MOUNTAINS

The Roads to Nirvana

RANKING THE LARGEST METRO AREAS IN THE U.S. FOR DRIVER FRIENDLINESS.
by Michael Karesh

YOU'RE READING THIS magazine, so you probably enjoy driving. But how much of it? If nearly all your time behind the wheel is spent commuting, likely not much. Sure, you could get out of town and experience the joy of an open, twisty road, but how often do you actually do that?

If you have a fun car but answered "not often," where you live might be the problem. Some of us are closer to good driving roads than others. Some of us enjoy more good weather than others. Then there's traffic. If you spend hour upon grueling hour gridlocked during the workweek, inside a car might be the last place you'd want to be on the weekend. The ideal driving city is near challenging roads, has many days of great weather, and suffers from little traffic—the opposite of Chicago. But even if you're in Chicago, it could be worse. You could be in south Florida.

TO RANK EVERY U.S. METRO AREA WITH MORE THAN A MILLION RESIDENTS FOR DRIVING QUALITY, WE:
• Scored the nearest challenging road

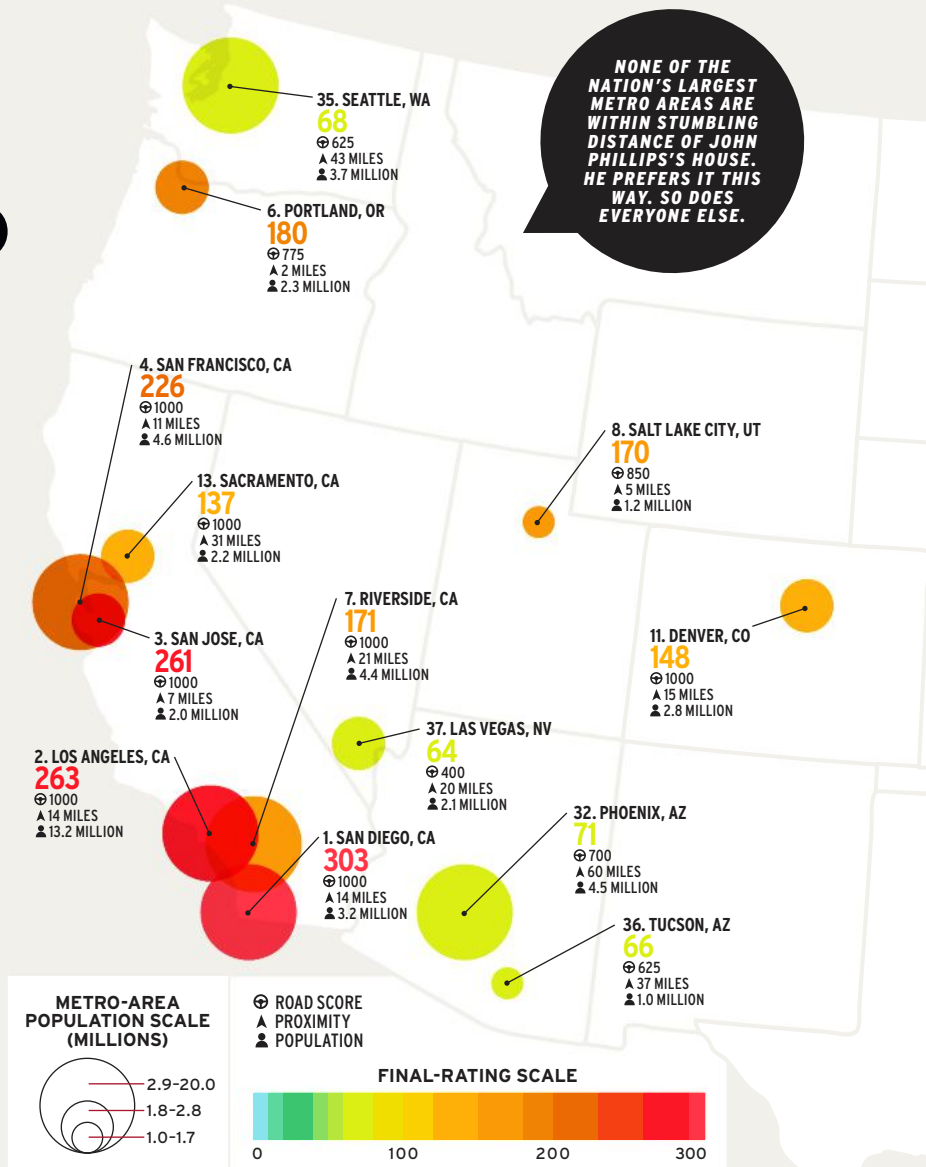
• Divided that figure by the time it takes to get to said road
• Multiplied the quotient by the number of days of decent weather*
• And divided by the amount of traffic*

Roads were selected to maximize the result for a given city. Finally, we indexed the results of our formula. **With the average set to 100, scores ranged from 13 to 303.**

THE MOST SEVERE POTENTIAL IMPEDIMENT: How far out of town will you have to get? In our six lowest-ranking areas, the closest fun road is more than 90

minutes away. Double that for round-trip travel and add time actually spent corner carving and you'll probably also want to check into food and lodging, meaning that driving the road will

likely be a perpetual next-weekend plan. But drivers in 23 of the largest U.S. cities can be on a great road in 30 minutes or less. In another 18, the fun can start in under an hour.

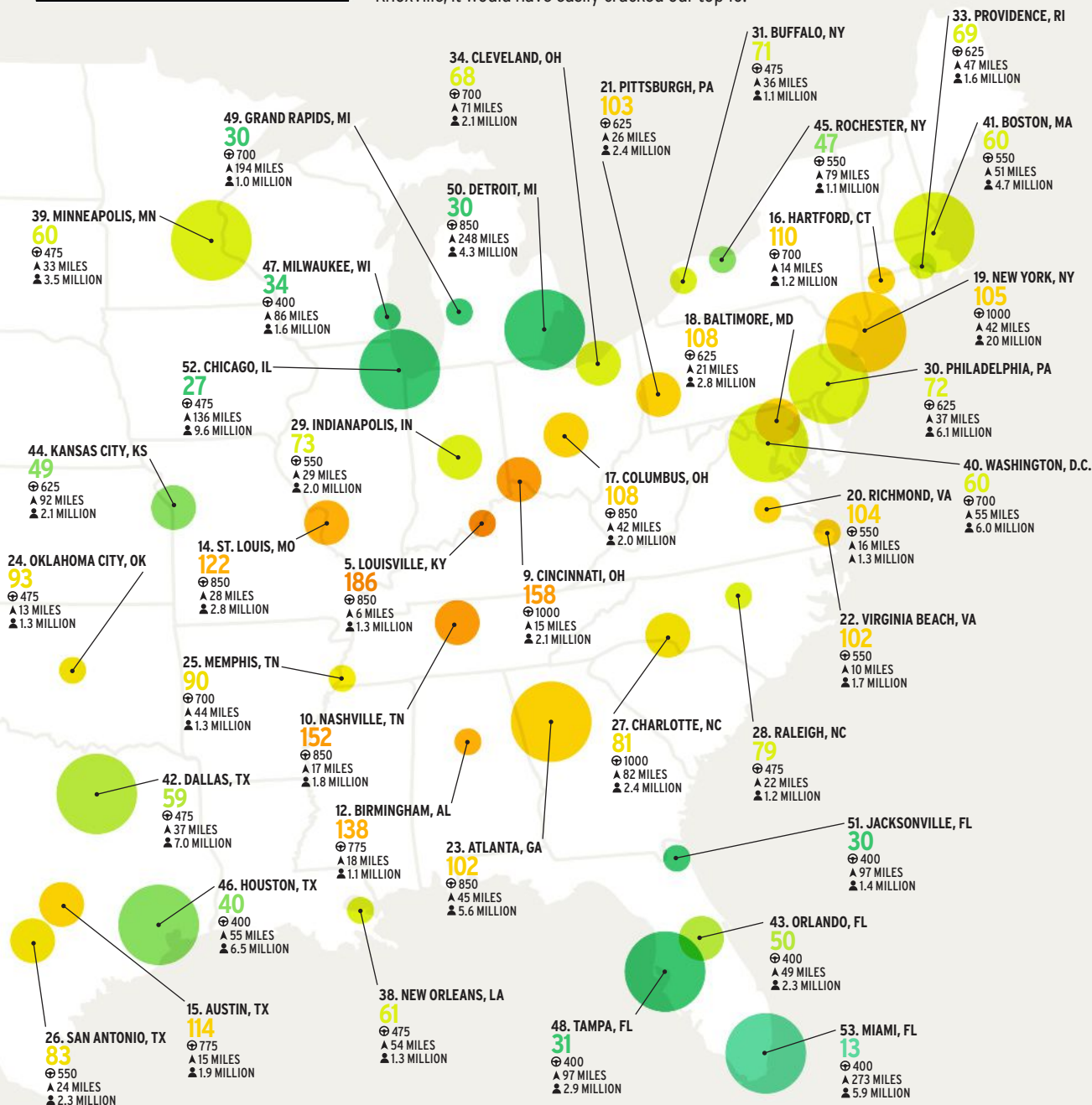


ROUTE ABOUT

We rated the roads near each metro area using Porsche's GTS microsite (porsche.com/microsite/gts/usa.aspx), which scores user-plotted routes according to the length and radius of curves along them, among other factors. We then converted those scores into figures that worked in our formula. We selected routes that generated the highest result. Routes were at least 10 miles long and had at least one section with 45-mph curves, no stretches without road markings, and began on an undivided road that wasn't lined with businesses or houses.

APPALACHIAN SHOUT-OUT

With just 857,585 residents, the Knoxville, Tennessee, metro area didn't meet our population minimum. But its mountainous terrain and reasonable property values make it ideal for drivers who prefer to spend more money on their cars than on their homes. It's only about 40 miles from the city center to the start of the most famous driving road east of the Mississippi, the Dragon. Had we included Knoxville, it would have easily cracked our top 10.



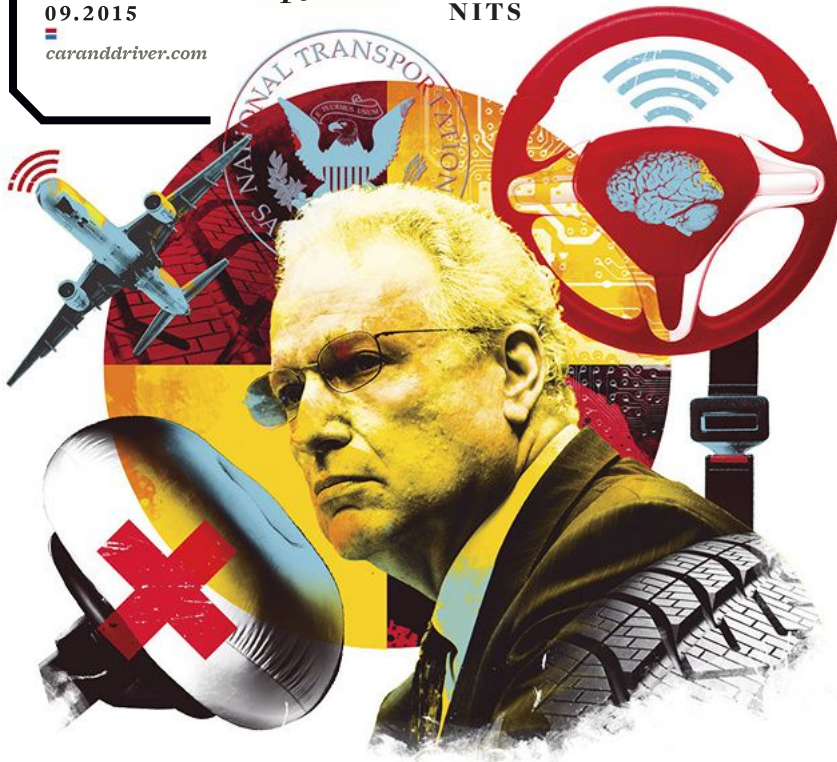
*Number of pleasant days calculated by Kelly Norton (kellegous.com); traffic data from Inrix.

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upfront . PICKING NITS



Q&A: Mark Rosekind

NHTSA'S NEW BOSS ON WHY THE SAFETY AGENCY NEEDS A BIGGER STICK. *by Jeff Sabatini*

JUST AS THE NATIONAL HIGHWAY Traffic Safety Administration (NHTSA) was about to close the books on 2014, a year in which a record number of cars were recalled, it underwent a change in leadership. On December 22, Mark R. Rosekind, a former NASA researcher and member of the National Transportation Safety Board (NTSB), was sworn in as administrator. The GM ignition-switch-defect investigation cast doubt on NHTSA's ability to police the industry, and Rosekind's tenure has so far been dominated by the Takata airbag recall, which has ballooned to become the largest consumer-product safety action in history. It's no wonder then that the head of the safety agency thinks he could use more clout.

C/D: Does NHTSA have an adequate mandate from Congress?

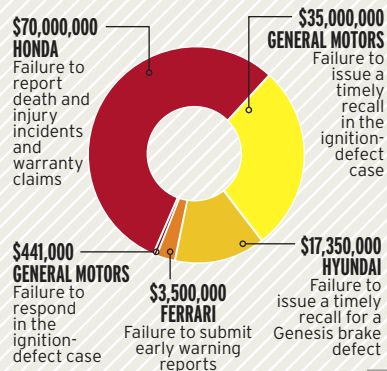
MR: Congress gave us a pure, straightforward mission: save lives, prevent injuries, reduce crashes. But we need better resources: people, technology, and authority. With all the visibility last year, complaints received here at NHTSA went from 45,000 to 80,000. Eight people look at those. That's just not enough. In the president's proposed 2016 budget, we have a significant boost. We identify two new divisions we will start. One is a trend-analysis division. And it wouldn't be just looking at complaints and early warning reports from manufacturers, but blogs,

social media, and websites. The other division is for field investigation and testing. So when there's a defect concern, we'd have our own crash-investigation "go team" well versed in looking specifically for defects.

C/D: Critics say that auto manufacturers are not wary enough of NHTSA, that their real fear is civil lawsuits. Is the recall system broken?

MR: There's been a lot of discussion about that. We're all about action now. The first week I was on the job is when we announced a \$70 million fine against Honda. There were two penalties, so we did the maximum we could. Authority is really critical. Our maximum penalty is

NHTSA fined automakers more than \$126 million last year, surpassing the agency's 43-year total. Here are the top five civil penalties issued by the safety agency in 2014:



\$35 million, and nowadays that's pocket change. So we have asked for a \$300 million penalty, because that's going to get attention and really change behavior.

C/D: Autonomous technology is looming on the horizon. Are the carmakers outpacing regulation here?

MR: Car technology is going to keep pushing forward no matter what. NHTSA's role is to make sure it's safe.

C/D: Do you see a future in which we are no longer driving?

MR: I come from NASA and worked at the NTSB, and my background is in human factors, so I frequently raise aviation examples. They used to have a pilot and a co-pilot, and it used to be "pilot flying" and "pilot not flying." Do you know what they say now? "Pilot monitoring." That's the co-pilot. We've already seen this, it's already happening in aviation, which is the safest mode of transportation right now. So you can look in the crystal ball and know what's going to happen. When you look at how automation has taken over the cockpit of airplanes—it's been 30 years now—what's interesting is the last few crashes we've seen have all been about the technology in the cockpit. Pilots didn't know what the computer was doing, and they weren't monitoring what was going on. The worst thing you can hear from a pilot is, "What's it doing now?" I don't care what is said about when these cars are going to be on the road; we know any new technology can take 20 to 30 years to fully come into the automotive fleet. Humans are going to go from having primary responsibility, from operating, to monitoring. But we already know what's involved there from aviation; we already know what the risks are. Driver education and human behavior and responsibility are not going to go away, even when we get self-driving vehicles.

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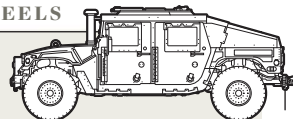
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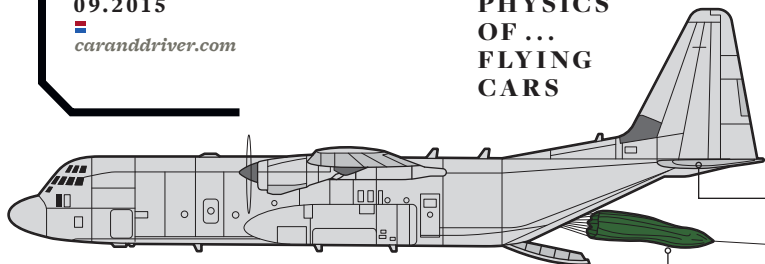
upfront

THE
PHYSICS
OF ...
FLYING
CARS

★ ANVIL ON WHEELS



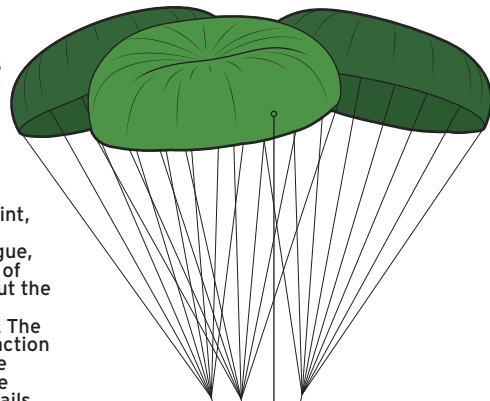
The Army's newest four-seat, turtle-back, armored HMMWV, the M1151A1 UAH, carries its center of gravity more than three feet off the ground and, when rigged for an airdrop, weighs 14,160 pounds.



SKYFALL The military performs heavy airdrops from both C-17 and C-130 transports. A C-130 drops cargo at an airspeed of 140 knots (161 mph) while flying at least 750 feet above ground level.

CHUTES TO THRILL

The aircraft tows a small, 15-foot drogue chute for 5 to 10 seconds before the navigator gives the green light to drop the cargo. At that point, the loadmaster releases the drogue, the sole purpose of which is to pull out the larger, 22-foot extraction chute. The drag on the extraction chute unlocks the platform from the aircraft's cargo rails and yanks it out of the C-130 at 0.93 g.



UNDER THE BIG TOPS

The primary chutes deploy as soon as the HMMWV is clear of the aircraft. Each of the three 100-foot-diameter G-11B parachutes weighs 275 pounds when packed.

DROP INTO THE DANGER ZONE

A single HMMWV requires a drop zone measuring 600 yards by 1000 yards. Each additional vehicle requires an additional 400 yards to allow for safe spacing of the trucks' landing sites.



Dropping Democracy

HOW THE ARMY YANKS A HUMVEE OUT OF A PLANE AND DRIVES IT AWAY 750 FEET LATER. *by Eric Tingwall*

THE CAR IS THE ULTIMATE mobility tool—right up until impassable terrain or enemy combatants come between you and your destination. Then you need a vehicle strapped to a parachute and packed into the back of a plane. The United States Army, perhaps the world's foremost authority on getting wheels on the ground in hard-to-reach places, routinely airdrops vehicles such as forklifts, ATVs, and HMMWVs (High Mobility Multipurpose Wheeled Vehicles, or "Humvees") to carry out missions around the globe.

The Army hasn't dropped vehicles in a major combat operation since 2003, as once you occupy the airfields, it's far easier to just land the planes. Still, airdrops play a key role in sustaining the remotest military bases, and soldiers routinely practice heavy drops back home to maintain proficiency in the science of making 14,000 pounds fall out of the sky and land intact. Here's how they do it:

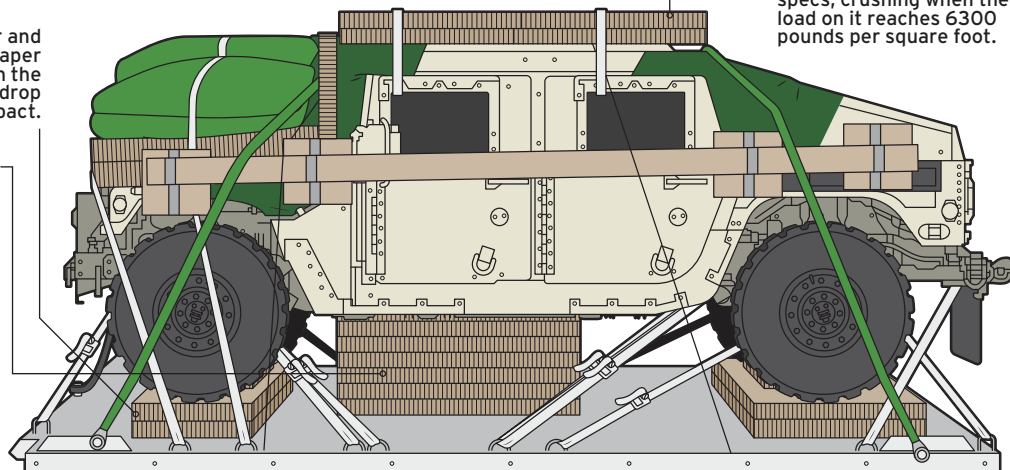
TURTLE-BACK TOUCHDOWN

LANDING SPEED DEPENDS ON A WIDE ARRAY OF FACTORS, RANGING FROM LOAD MASS TO AIR DENSITY AT GROUND LEVEL. WITH A DROP ZONE AT SEA LEVEL, AN M1151A1 UAH, THE ARMY'S NEWEST HMMWV, TYPICALLY LANDS WITH A SPEED OF 24 TO 25 FEET PER SECOND.

HUMMDINGER Lumber and sheets of three-inch-thick paper honeycomb, stacked between the axles, the frame, and the airdrop platform, cushion the impact.

HONEYCOMB CRUNCH

As many as 11 layers of honeycomb are positioned under the vehicle, but this M1151A1 UAH will compress only four layers during a normal landing. A hard impact at 28.5 feet per second (worst-case scenario) should crush five layers while using the entire nine-inch stroke of the HMMWV's suspension to absorb the shock.



FORT BENDING

While it looks like ordinary cardboard, the honeycomb is designed to rigorous performance specs, crushing when the load on it reaches 6300 pounds per square foot.



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upfront · THOSE WACKY BRITS

CHEVY'S R07 NASCAR BLOCK. IF IT'S CAST IN OLD BLIGHTY, WAS THE REVOLUTION REALLY A SUCCESS?



★ ARTHURIAN WIZARDRY

Rolls-Royce's Merlin V-12 aircraft engine is the greatest of all British machines. In the Spitfire and Hurricane fighters, it won the Battle of Britain. Americanized versions were even better in the P-51 Mustang. But Rolls-Royce could not have imagined there'd be demand for Merlin parts a full 65 years after it ended production in 1950. Among Grainger & Worrall's latest casting projects has been the production of reengineered, brand-new cylinder heads for the Merlin. These heads keep planes like the **Royal Air Force's squadron of vintage Spitfires**, Hurricanes, and Lancaster bombers flying.



company is so off the radar that it doesn't even have a Wikipedia page—at least not yet.

"Motorsport gets the headlines," says executive director Edward Grainger, "but they're only about 20 percent of our business." Meanwhile, the rest of the 500-employee company is busy casting blocks and other components for the Bugatti Veyron, Bentley Mulsanne, and Koenigsegg Agera, among other exotics, and helping develop projects such as Ford's 2.7-liter EcoBoost V-6.

"Our foundries are very modern and new," explains Keith Denholm, G&W's head of engineering. "It's not unusual to go out on the floor and see laser scanning being used to make a mold. It's closer to a laboratory than a coal-fired, dusty, and dirty environment." One new technology G&W now employs is computer-

printed molds and cores for sand castings. "Within the space of 24 hours, we can go from there being nothing to a functional casting," says Denholm.

While various metals pass through G&W's furnaces, the company's expertise with compacted graphite iron, with its robust lattice-like metallic structure, is what reeled in the NASCAR business early in the 2000s. GM's wildly successful R07 block, a G&W casting, has exceptionally thin cylinder walls. But it has proven tough enough that some of the blocks cast when the engine was introduced in 2007 are only now, after several remachinings, reaching the end of their useful lives. And Chevrolet has won the NASCAR manufacturers' championship every year since the R07 was introduced. "Instead of number of races, it's number of championships we've won," says Grainger, unintentionally proving that you don't need a household name to dominate NASCAR.



↑ Top: Keith Denholm swears he doesn't use G&W's printers to make sweet sand castles, but fails to volunteer an alternative explanation for all those weekend hours he logs.

Casting Call

GRAINGER & WORRALL IS THE LITTLE ENGLISH FOUNDRY THAT CAN.

by John Pearley Huffman

NASCAR IS THE red, white, and bluest form of racing there is. But the very heart of most NASCAR stockers is born at Grainger & Worrall, a family-owned company in the British West Midlands town of Telford, Shropshire. Every Chevrolet and Ford starting the Daytona 500 this year ran a block cast by Grainger & Worrall. As does every Chevy, Dodge, and Ford facing off in NHRA Pro Stock drag racing. Confidentiality agreements keep G&W from saying what, exactly, it casts for Formula 1 racers, but several teams are customers, including the dominant Mercedes-AMG Petronas. G&W also supplies castings to teams in WRC, Le Mans, and FIA Touring Car racing. Yet, somehow, the

photography by CHARLIE MAGEE

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by John Phillips

THE YIN AND YANG OF FLING AND FLUNG.



My father was fond of punishing inanimate objects. He owned a pair of loafers with metal buckles, and when the buckles chafed his feet, he grabbed a claw hammer and reduced the offending metal to brass parings, resting occasionally to fling the shards down the basement stairs. With each fling, a bad word was involved, but when he finished the job he smiled and handed me the *Columbus Dispatch* to show me a particularly colorful Formula 1 race report.

I also recall a metal recirculating fan that blew air only when it wasn't pointing at my father. The fan landed maybe 70 feet in our front yard, exploding in a grassy shower of blades and sheared electrical wire. It looked like a hang glider had crashed there. When our lawn-mowing guy arrived, my dad

told him to mow around the wreckage. The fan's punishment wasn't over.

In our house, tenses mattered. An item that was "flung" was in the trash. An item you could "fling" was a household excrescence that had insulted my father and was scheduled for airborne adventure. Turns out that flinging doesn't fall far from the tree.

About 20 years ago, I was installing winter tires on my fiancée's Acura Integra. But the handle for my hydraulic floor jack had stripped its set screw, and it repeatedly fell loose onto the garage floor with an annoying alarmlike clang. I can't pinpoint exactly which of its clangs finally pushed me into Bob's Berserko Lounge. I just remember the four-foot handle achieving a stunning apogee, backlit by the sun, then descending to strike a piece of ice in the mill pond behind my house. It bounced once, then landed in open water and skipped a little, like a flat stone, before drowning in the pond's deepest channel. I held up my arms as if signaling a touchdown. But when I wandered back into the garage, the right side of the Integra was still three feet off the ground, more or less permanently on a jack that was now more or less permanently handle-free.

A few days later, a Craftsman ratchet joined the jack handle as a piece of aquatic art. "You prevent a man from bolting in

"The bungee let go, achieving perhaps the speed of sound before its metal hook horsewhipped my upper lip and teeth."

a battery?" I yelled at the wrench as it twirled through atmosphere sufficient to earn air miles.

When I lived in Toronto, I owned an early-1980s Honda XL250 motorcycle. I got all dolled up for a date one night and climbed atop the bike with a bottle of Lion d'Or Cabernet squeezed between my legs, its neck pointed at my crotch and its base held in place with a Canadian Tire bungee cord. On my second attempt at kick-starting the Honda, the bungee let go, achieving perhaps the speed of sound before its

metal hook horsewhipped my upper lip and teeth. I could feel enamel grit on my tongue. "Try to tear a man's lip off?" I screamed. So it went a-flinging into the Don Valley woods, where it annoyingly held fast to a sycamore branch. I felt that the wine had been complicit in this shameful assault upon my face, and it likewise enjoyed a free trip to the forest, swallowed noiselessly in the shadows. I hope the deer drank it.

But my blackest microburst of bile was reserved for a maroon Mercedes that I drove to the Chicago auto show years ago. Along the way, lake-effect storms had attempted to kill me, so I arrived at the Drake Hotel tired and furious with, I don't know, Gottlieb Daimler and God, I guess. Instead of being greeted by the Drake's doormen wearing those fabulous Russian Army coats, I was greeted by three of the most loathsome PR flacks in the business, who set upon me like bottle flies.

The innocent Benz's shifter bore the brunt of my steam. I slammed it into park so hard that the shift handle swiveled 180 degrees, and the metal lever cracked and teetered to the northeast, achieving an angle recommended in no known handbook of ergonomics. Some wires burst free. The little PRNDL no longer contained any letters an English-speaking person could read. And that's when I noticed the Benz was not in park but neutral, because the only two gears remaining, post-snit, were neutral and drive.

"How was your trip over?" asked the PR guy famous for having never stopped talking since the Cuyahoga River caught fire. I told him I'd had some trouble shifting. He peered at the center console and shook his head. "Wow," he said. "That thing's in death's nursery." Not that it's important or anything, but you should try driving around Chicago for three days with no reverse gear. It cost \$600 to fix. I still feel bad about it. So here is

my apology:

*I pledge allegiance to Zed F,
Of Friedrichshafen and
Baden-Württemberg,
And to Zahnradfabrik,
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by Aaron Robinson

TRAFFIC TICKETS HAVE BECOME
A TAX-HACK PILE-ON.



People with absolutely no friends in your state's capital include terrorists, communists, smokers, and those cited for a driving offense. No politician with reelection on his or her mind would lift a finger to help out speeders and stoplight runners. Hey, they broke the law, they deserve whatever we give them, right? This political truth proved itself over and over again in the last decade as states rushed to patch holes in annual budgets by dumping more and more extraneous fees onto traffic tickets. As with a cigarette tax, a traffic-ticket surcharge generates little opposition from the assembled representatives, none of whom wants to be seen as representing the interests of law-breakers. In Pennsylvania, fees have been tacked onto tickets for state police training, emergency medical services, the

state's judicial computer system, a fund to compensate people injured by medical negligence, and a program to provide legal services for the indigent. A \$57 fine thus lands on your wallet as a \$158.50 pile of random taxation. It's worse in California, where a typical \$100 fine pencils out to \$490. Over the past 50 years, the State Assembly in Sacramento has run riot with traffic levies, the *Los Angeles Times* reporting that 80 percent of a traffic ticket's bottom line has nothing to do with the actual offense. Among the add-ons: a fee to aid people with traumatic brain injuries, a fund to help victims of violent crimes, and a toll for the protection of state wildlife. Texas and Michigan have enacted "driver responsibility" programs that impose recurring fees above and beyond the initial fines for repeat offenders. In the Great Lakes State, drivers who amass seven points in two years are assessed a \$100 fee each year and an extra \$50 for any points accumulated above that. If you can't provide proof of insurance by your court date, it's another \$400 in fees over two years.

Sure, seven points in two years is a lot of lawlessness, and I have to pay for car insurance, so why shouldn't everyone else? The road is absolutely no place for drunks, deadbeats, or careless idiots, but surcharging, that politically expedient hobbyhorse for back-door regressive taxation,

"Some politicians finally realize that traffic tickets aren't a bottomless money well."

is proving to have negative side effects.

For one thing, the higher the fees, the more people simply don't pay. Michigan reports a collection rate of only around 50 percent on its driver-responsibility program, and California figures it faces \$10 billion in uncollected fines, which has driven many of the various programs dependent on them to insolvency. In California, if you miss the initial deadline to pay, another \$300 automatically gets slapped onto your bill and your license is revoked until you pay the full charge, penalties and all. That

and the increasingly limited access to the overcrowded courts to get problems sorted out have produced more than 4 million license suspensions in the past eight years. In Los Angeles, as in many cities with poor public transport, losing a license can be an express train to joblessness and poverty. Bloated ticket surcharges give many poor folk the unhappy choice of either becoming worse offenders by driving illegally or staying home to starve.

Traffic-ticket abuse, high surcharges, and a confounding wall of bureaucracy were cited in an investigation by the Justice Department of police practices in riot-torn Ferguson, Missouri. There, in 2013 alone, a city of 21,000 issued 33,000 arrest warrants for unpaid traffic tickets and other minor offenses, counting on the chiseled revenue for 21 percent of the city's operating budget. Civil libertarians suing the city say Ferguson has effectively created a debtors' prison system that jails those unable to pay the jacked-up fines while rewarding private debt-collection companies with copious profit.

California doesn't go out of its way to explain its fees, either. I dug into my, ahem, rather thick folder of past tickets and could not find a single document explaining how, for example, a 2010 citation for crossing a double-yellow while not having proof of insurance (which I fought and beat) cost \$1085. Indeed, it took a half-hour of Googling to find the PDF of the state's current fee schedule, which is buried on the dense California Courts website. The current fine for the double-yellow offense is \$35; for the missing insurance card, \$200. However, add on the state's 10 separate extra fees to each and you get \$238 and \$900, respectively.

Some politicians finally realize that traffic tickets aren't a bottomless money well. Michigan is phasing out its driver-responsibility program due to rampant nonpayment and widespread hatred of it.

In 2012, California governor Jerry Brown vetoed another \$1 surcharge for spinal-cord research, writing that fines should be based on "reasonable punishment, not on paying for more general-fund activities." This year, Brown, who is term-limited, proposed a partial amnesty for ticket debtors that would cut their payments in half.

Brown thinks that California is better off if more drivers are back on the road legally, going to work, engaging in commerce, and, most important to state coffers, paying their taxes fair and square. ■



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TLX IT'S THAT KIND OF THRILL



by **Ezra Dyer**

Z06s I HAVE KNOWN.



The Corvette Z06 and I go way back. A 2002 Z06 was the first test car I ever wrote about, back when having 405 horsepower warranted carrying a badge that read “405 HP.” Those early cars were voted “Most Likely to Have Their Titanium Mufflers Replaced With Glasspacks Because The Owner Thinks ‘Titanium’ Is That Thing Where You Have A Ringing In Your Ears.” The C5 Z06 was powerful, always entertaining, and just a little bit cheesy: the Hulk Hogan of cars.

A few years later, I got the first crack at the new and way-overhauled C6 Z06, a scary car to drive at the limit. I brought it to the infield road course at Charlotte Motor Speedway, where I challenged Dale Earnhardt Jr. to a duel. The equalizer: I’d have the Z06, while he’d drive a Chevy Cobalt SS. My

editors were not confident that this was a great challenge—they thought Junior would cream me anyway. But as it turns out, 300 extra horsepower was more than enough compensation for my talent deficiency. I’ll bet I could do all right in the United States Pro Kart Series, too, as long as I got to drive an Audi R18.

Over the years came more Z06 experiences: scything through Ohio cornfields in a cammed-up Lingenfelter Z06, which at idle felt like sitting inside an unbalanced washing machine. Christmas of ’06, I brought my tree home on the roof of a silver Z06. And about five years ago, I took my mailman on his route in a Corvette. That was a ZR1, though. It got 3 mpg, which is one reason that the U.S. Postal Service generally refrains from using supercharged Corvettes.

The 2015 Z06 hadn’t been out long when I got ahold of one and started brainstorming the next chapter in my book of Dumb Z06 Activities. I had a notion to take it to a drag strip, but that seemed too obvious. So I entered it in a Porsche Club of America autocross. The local PCA has a good sense of humor about me showing up at their events in non-Porsches, which is pretty much always the case.

On the appointed Sunday, I arrived at the employee lot of a defunct carpet factory. The original venue, a community col-



► **Only one car at the autocross attempted a wheelie.**

lege with a freshly paved lot, apparently got cold feet at the 11th hour and bailed, leaving a fleet of flat-six enthusiasts with nowhere to get their competition fix. Here, the desiccated pavement was crazed with cracks, but the real wild card was the speed bump, an unavoidable yellow lump that you’d have to hit twice per lap. The guy who brought a Macan Turbo was psyched. He wouldn’t have to slow down.

The Z06 that I brought, a convertible, wasn’t equipped with the chin-scraping aero package, but it was still far from the

ideal ride for this scenario. With 650 horsepower, I had about 550 horsepower more than I could use. I even screwed up choosing my car’s competition number. I asked for 33, Larry Bird’s jersey, and the woman at the sign-up table said: “That number’s available. Probably because it’s hard to make threes out of masking tape.” She was right. I spent the next 15 minutes tediously applying my chosen numbers to the doors. It wouldn’t be the last time that I was slow.

Of this very car, Don Sherman wrote, “The Z06’s front tires trip over themselves in tight turning maneuvers, a fault attributable to steering geometry that is optimized for limit-cornering performance.” Tight turning maneuvers? This whole place was a tight turning maneuver. Dan Neil from the *Wall Street Journal* brought a 2016 Mazda Miata, an entirely more sensible choice when your track is made of orange cones and includes an Employee of the Month spot. Autocrossing a Z06 is like having a nuclear war in your living room.

Nonetheless, I gave it my best shot. I pulled to the line and set off through the slalom, the Z06’s Nicki Minaj haunches barely fitting between the cones. Then, the speed bump. I braked, eased over the hump, and hammered down once the rear tires were clear. Somehow, I don’t think they planned for this particular situation during development at Milford. Compression, rebound, compression, rebound: Hooking up on the far side of the hump, the silver Vette very nearly pulled a wheelie. Which is not the ideal setup for, you know, turning. I hammed it around the course for a time of 41.7 seconds, laying strips of rubber across the finish line. I never got out of first gear.

The Miata, by comparison, looked like a steeplechase horse bounding gracefully across the course. I saw no brake lights at the speed bump, but neither was there any crunch of impact on the far side. The Mazda slewed over like a yawl in the horseshoe corner, settling into a four-wheel drift at approximately 12 mph. It looked good. It looked like fun. Neil’s time: 41.7.

Perhaps there’s some moral here about overkill, about the virtues of nuance, but the Z06 and I don’t know what it is. The 2015 Chevrolet Corvette Z06 is more polished than it’s ever been, but Terry Bollea in a pair of Dockers is still the Hulkster. Now let’s see if we can pull a wheelie, brother. ■



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CONSIDER THE CROSSOVER. NOW, PLEASE STOP IT.

by Jeff Sabatini

What can easily be forgotten in this age, when anyone with a Twitter account and opposable thumbs can call themselves a “content creator,” is that words matter. We are called *Car and Driver*, which over the years has made us unusually protective of the word “car,” even more so than those car companies around which our world revolves. That word—car—its meaning both to the general public and to us as enthusiasts, has long been threatened with dilution by all manner of conveyances that are not cars, from trucks to minivans to SUVs.

But right now it is the actual physical car that is being subsumed. Compact crossovers have surpassed mid-size sedans to become the most popular body style, claiming 16 percent of retail sales last year (to 15 percent for sedans), according to the market data firm IHS Automotive. This is a significant milestone, on par with cars first being relegated to minority status in 2001, when trucks and SUVs accounted for 51 percent of U.S. sales.

The beasts of burden of that era had body-on-frame designs, and the word “crossover” had yet to come into widespread use. A year before, during Pontiac’s launch of the Aztek, GM referred to its seminal crossover as a “hybrid,” unaware (or unconcerned) in its idiolect that such a thing, a much different thing, had already been so labeled. But in the early aughts, Toyota still referred to its pioneering crossover, the RAV4, as an SUV.

While there had been car-based utility vehicles before Toyota’s “cute ute,” it was the Japanese automakers that fully embraced the crossover. Customers became enthralled with the raised seating position and the extra ground clearance that enabled ample suspension travel to accommodate our increasingly deteriorating roads without the agricultural ride of traditional SUVs. Evolving child-safety-seat mandates relegated kids to the back, and automakers added a third row, birthing a larger variation. Parents, freed from soccer-mom shame, were willing to pay, replacing their minivans with quasi-utes. The business of crossovers, which could be sold for more than their counterpart sedans, boomed.

All this did not go unnoticed by luxury purveyors, who have unleashed crossovers with such abandon that traditional size descriptors no longer apply [see Mercedes-Benz GLE Coupe, page 098]. And because modern MBA

doctrine insists that every profit center must be exploited as rapidly and fully as possible, an even smaller wave of compact crossovers [see comparo, page 086] is now filling the marketplace like circus clowns in a Volkswagen Beetle. Some predictions have crossovers making up 20 percent of the U.S. market by 2020, as more two-box designs emerge from carmaker studios.

We stand wary. In the rush to get some of these branded appliances to market, considerations as varied as styling, performance, efficiency, and handling have been overlooked. And consumer appeal is such that automakers are now calling almost anything a crossover. Infiniti has plans to market the very same body shell as two different models, a car called the Q30 and a crossover dubbed QX30. Audi withdrew the A4 Avant wagon from the U.S., lifted its suspension, and sent it back to us as the Allroad crossover. They’ve even begun to have a deleterious effect on car choices: Mazda will forgo selling the redesigned Mazda 2 hatchback here, justifiably expecting the CX-3 crossover to satisfy the entirety of its small-car demand. Which, having now driven the CX-3, we admit is maybe not a such bad idea after all.

Look—we Americans need our space. We have kegs to haul and kids to get to baseball practice. There are times when a sedan won’t get the job done. And as crossovers mature beyond generic lozenges festooned with corporate-identifier grilles and injection-molded bumpers, there will certainly be worthy examples of the species. But we’ve had it with boring-looking, boring-driving slugs that squeeze interesting cars off the corporate product plan. Who will save the car from the crossover? It is up to you and me. Read on to see which carmakers are fighting the low-CG fight in 2016, and then go out and buy yourself a Cadillac CTS-V.

THE LIST

Details of each brand’s 2016 lineup begin on the next page. Significant changes merit their own entries; minor updates, unchanged models, and discontinued vehicles are noted at the end of each brand’s entry.

Acura NSX



Acura

ILX: For 2016, Acura's Civic-based sedan only comes one way: with a 201-hp 2.4-liter four and a new eight-speed dual-clutch automatic. The manual trans is gone. Clever restyling of the LED headlights and the front and rear fascias makes the ILX look like the larger TLX. To combat NVH, the ILX now has thicker front-door glass, additional sound deadening, and active noise cancellation. An A-Spec trim level adds a more aggressive look, but it's still no Integra Type R.

MDX: Acura's seven-passenger SUV gains a nine-speed automatic and a reengineered Super Handling All-Wheel Drive system that is purported to improve handling.

NSX: After an 11-year hiatus, a new mid-engined NSX is bound for Acura showrooms. It's built in Marysville, Ohio, with an aluminum space frame, a carbon-fiber floor, steel A-pillars, and plastic body panels. A longitudinally mounted twin-turbo 3.5-liter V-6 with dual-overhead cams shares nothing with other Honda/Acura V-6s and connects to a nine-speed dual-clutch automatic. An electric motor sandwiched between the engine and gearbox adds power to the mix. Driving the front wheels are two electric motors that also provide torque vectoring. Total output is expected to be in the neighborhood of 550 horsepower, and the price is expected to be in the \$150,000 to \$180,000 range.

RDX: LED headlights and redone front and rear ends are the obvious changes to Acura's mid-size SUV. Under the new duds is a revised 3.5-liter V-6 that adds cylinder deactivation and bumps up fuel economy on the highway cycle by 1 mpg. The optional four-wheel-drive system is now tuned to send more power to the rear wheels.

Minor trim changes: RLX/Sport Hybrid
Unchanged: TLX

Alfa Romeo

Giulia: The second phase of Alfa Romeo's reentry into the American market touches down in the make/break sports-sedan category, most recently assaulted by Jaguar with the XE. A V-6 and rear-drive are Alfa's primary

weapons, though we expect a four-cylinder model, and Alfa, cognizant of Snowbelt sales, will also offer four-wheel drive. The company claims a 3.9-second zero-to-62-mph time for the hottest version, a 510-hp Quadrifoglio with a twin-turbo V-6. It's a machine explicitly built to take the fight to the BMW M3 and Mercedes-AMG C63, the segment's perennial performance titans. While Alfa hasn't announced an official weight, reading between the press-release lines suggests a target of 3300 pounds. Given the Italian tendency to use something akin to lunar gravity while weighing automobiles, we'd expect it to arrive between 3500 and 3600 pounds wet. The relatively svelte Cadillac ATS bulks up to 3800 pounds in its V guise, so the Alfa's mass should still be competitive.

If not quite the aesthetic knockout that its predecessor, the 159, was, at least the Giulia is an attractive machine. Attractive and Italian are good enough for more than a few first-year sales, but to

reestablish an American foothold for the brand, the Giulia will have to offer not just an alternative to the Teutonic troika of Audi, Mercedes-Benz, and BMW, but a compelling car in its own right, with legs to stand on once the press runs out of "Me and Giulia Down by the Schoolyard" headlines.

4C Spider: see first drive, next page

Minor trim changes: 4C

Aston Martin

DB9 GT: Aston's venerable sports car is now appended with the GT suffix, as well as 30 more horsepower (for 540 total) and new wheels and headlights. Perhaps more important is a new infotainment system, which replaces a unit antiquated enough that it was quite possibly powered by vacuum tubes.

Rapide S, Vanquish: Both are now offered with an eight-speed automatic and the infotainment-system upgrade.

Alfa Romeo Giulia





FIRST DRIVE

SPIDER BITE

YOU'LL YOWL WITH PLEASURE

AND PAIN BEHIND THE WHEEL OF

ALFA ROMEO'S 4C SPIDER.

by Davey G. Johnson

Alfa Romeo's new Spider isn't a convertible in the sense that say, an Aston Vanquish Volante is a convertible. Instead, the flyweight Alfa features a roll-up softtop that can be stashed in the car's diminutive trunk, leaving just enough room for a briefcase. A lift-off carbon-fiber hardtop is available for \$3500, but that Targa-esque panel is not stowable in the vehicle. The 4C, you see, makes no pretense of practicality.

What the Alfa does make is noise. And while the 4C coupe can be unfortunately boomy and whooshy inside, suffering from high-unbearable resonances at certain engine speeds, the roofless nature of the Spider lets these regrettable sounds dissipate to the sky, leaving only the righteous bark of the 237-hp 1.7-liter turbo four.

Inside, the cockpit remains an exercise in forced intimacy. Refuse to take proper care upon ingress and egress and your head may become forcefully intimate with the carbon-fiber windshield frame. The Spider is, however, a bit fancier than the hardtop in its base trim, with a full-leather interior standard. And we're glad that last year's Parrot

SPECIFICATIONS

VEHICLE TYPE
MID-ENGINE, REAR-WHEEL-DRIVE, 2-PASSENGER, 2-DOOR TARGA

BASE PRICE
\$65,495

ENGINE TYPE
TURBOCHARGED AND INTERCOOLED DOHC 16-VALVE INLINE-4, ALUMINUM BLOCK AND HEAD, DIRECT FUEL INJECTION

DISPLACEMENT
106 CU IN, 1742 CC

POWER
237 HP @ 6000 RPM

TORQUE
258 LB-FT @ 2200 RPM

TRANSMISSION
6-SPEED DUAL-CLUTCH AUTOMATIC WITH MANUAL SHIFTING MODE

DIMENSIONS
WHEELBASE: 93.7 IN
LENGTH: 157.0 IN
WIDTH: 73.5 IN
HEIGHT: 46.7 IN

PASSENGER VOLUME
47 CU FT

CARGO VOLUME: 4 CU FT

CURB WEIGHT: 2500 LB

PERFORMANCE (C/D EST)
ZERO TO 60 MPH: 4.3 SEC
ZERO TO 100 MPH
11.3 SEC
1/4-MILE: 13.1 SEC
TOP SPEED: 160 MPH

FUEL ECONOMY (C/D EST)
EPA CITY/HWY
24/34 MPG

stereo has been replaced by an Alpine unit, which we can at least figure out how to turn on.

On heaving, patched pavement, the high-strung chassis forces the driver to constantly manage the steering. Chuck it down a smooth road, however, and the 2500-pound

Spider is a sweetheart. Apply throttle at a bend's two-thirds' mark, and the grunt builds progressively. You'll be at full roar by the exit; the rear end will step out ever so slightly then tuck back into line in one smooth, progressive motion. Presto! You're off down the straightaway, spitting upshifts. We did encounter a bit of spooky lightness hurling the car over the crest on Laguna Seca's front straight. If you do manage to bend the thing out of shape, it's easier to reel back in than its combination of short wheelbase, quick steering, and mid-mounted engine might suggest.

Alfa acknowledges that this \$65,495 sun scooper will be cross-shopped, though it claims that the car has no direct competitor. The only other carbon-fiber car under \$100,000, the BMW i3, features a battery pack and looks like a front-loading laundry machine. Porsche's Boxster, starting price of \$52,395, offers a power-folding ragtop, a naturally aspirated engine, and power steering, but its chassis is made of less-exotic stuff. The closest thing to the Milanese bulldog is the Lotus Elise.

As a track toy, the open Alfa's a fine little thing. As a throwback to the era of cramped, wonky Italian sports cars, it does a passable impression. As a boulevardier for the fashionable, the flinty ride makes profiling on the Meatpacking District's cobblestones largely impossible. It's hard to look cool with your teeth rattling. But given that the open roof adds only 22 pounds and offers unlimited headroom, if you're going the 4C's way, go Spider.

Vulcan: A British car whose name invokes the god of fire isn't so much tempting fate as showing up on her doorstep with flowers, chocolates, and two tickets to the opera. Thankfully, the racetracks to which the not-road-legal Vulcan is confined will have emergency crews. A 7.0-liter, 800-plus-hp V-12 goes into a carbon-fiber monocoque to make one very-hot-blooded machine. Aston plans to sell only 24 of these \$2.3 million toys, with deliveries commencing by the end of the year.

Minor trim changes:
Vantage

Audi

A6/S6: Output for this sedan's gasoline engines goes up across the board. The 2.0-liter TFSI inline-four adds 32 horsepower for a total of 252; the 3.0-liter V-6 rises by 23 to 333 horsepower; and the 4.0-liter V-8 in the mighty S6 is up 30

ponies to 450. The exterior gets new front and rear fascias, LED head- and taillamps, and new trapezoidal tailpipes integrated into the lower bumper. An optional sport exhaust with black tips is available on S6 models.

A7/RS7/S7: As with the A6, minor exterior revisions and LED illumination mark the 2016 edition. The A6's powertrain upgrades also apply, while the 3.0-liter TDI V-6 and the RS7's 560-hp V-8 stand pat.

Q7: New for 2017, the big SUV launches late this year with fresh sheetmetal and a tasteful and contemporary interior. Initial engine options will be a 272-hp 3.0-liter TDI and a 333-hp supercharged V-6, both mated to ZF's eight-speed automatic. Diesel and gasoline V-8s, as well as a hybrid, may be in the cards.

R8: see first drive, this page



TT/TT roadster/TTS:

The third generation of Audi's high-style, low-slung coupe/convertible arrives for 2016, adhering fairly closely to the original TT formula. A 2.0-liter four producing 220 horsepower and 258 pound-feet shuttles output to all four wheels via a six-speed dual-clutch automatic, the only available transmission. Output from the 2.0-liter rises to 292 horsepower and 280 pound-feet in the TTS coupe.

Minor trim changes:
Allroad, A3/A3 cabriolet/S3, A4/S4, A5/A5 cabriolet/S5/S5 cabriolet, A8/S8, Q3, Q5/SQ5
Dead: RS5, S3 cabriolet, TTS roadster

FIRST DRIVE

SARTHE BOUND

WE GET A QUICK TASTE OF

THE NEW AUDI R8 AT LE MANS,
JUST PRIOR TO THE BIG RACE.

by Mike Duff

As your mother probably warned you, there's no second chance to make a first impression. And Audi was clearly determined that our initial experience with the new R8 would be a memorable one.

The invitation was simple: Come to Le Mans for the 24-hour race and, during a break between practice and qualifying sessions, take the new R8 for a single lap of the track. That means just 8.5 miles of the Circuit de la Sarthe to get acquainted.

The drive itself was every bit as surreal as we secretly hoped it would be. But before we get to that, a bit about the car itself: The new R8 looks very similar to the first-generation wedge but is almost entirely new. It's closely related to the Lamborghini Huracán, to a far

Audi Q7



greater extent than its predecessor was to the Gallardo, with both cars sharing the same basic structure including an aluminum space frame reinforced with a carbon-fiber floor. The V-8 option is gone; now there's just a choice between two V-10s, in standard 540-hp and 610-hp-Plus forms. And there's no manual gearbox, either. A mere 3 percent of first-gen R8s were being built with one by the end, and the seven-speed S tronic dual-clutch automatic is now faster-acting than before. Although drive still travels to all four wheels, torque to the front is now dispatched by an electronically controlled clutch instead of a viscous coupling.

The inevitable delays getting onto the track mean there's plenty of time to make a considered assessment of the new R8's cabin. It is lovely. Conventional instruments are gone, replaced—as in the new TT—by a high-res screen that fills the binnacle and can be configured into several different modes.

With entirely predictable French unpredictability, we are suddenly snapped out of a bored patrol of the radio presets by an angry marshal gesturing all of us onto the track en masse. Our R8s are all Plus versions and are being sent out at the back of an esoteric pack of thrill seekers, including 911s from the Porsche Experience Center and some two-seat sports cars normally used to provide passenger rides on the short Bugatti Circuit.

On the track, something close to chaos reigns. Yellow flags are waving, some marshals standing well into the track to make the point that this is supposed to be a polite demonstration lap. But our pace car is an R8 LMS racer being driven by Tom Kristensen, and he sets off at the pace you'd expect from a nine-time Le Mans winner. It's a good opportunity to confirm that the new R8 is a seriously rapid machine, with acceleration that's subjectively brisker than that of the old 550-hp R8 V-10 Plus. The engine pulls hard to its 8500-rpm redline, with the whole instrument panel changing color when it's time to upshift. The paddles behind the steering wheel feel light and plastic, but the shifts themselves are lightning fast.

Reaching the start-finish line brings the chance to navigate a couple of tight chicanes and delivers welcome proof that, behind Audi's trademark generous servo assistance, the new R8 stops as well as it goes (carbon-ceramic brakes are standard on the Plus model). But as with the Huracán, the electrically assisted steering feels too light and, unlike the French themselves, short on meaningful resistance, especially when compared with the communicative helm of the old car.

The grandstands are still half full of fans who are either waiting for the later qualifying session or hoping to see somebody wreck an expensive

new supercar. Which very nearly happens as one of the R8s suddenly slows to a waving-to-the-crowd pace and narrowly avoids being rear-ended by the safety car. Passing under the Dunlop bridge is a moment that defies even our best attempt at professional cynicism. This leads to a demanding sequence of corners, with the marshals guarding this part of the track seeming to have adopted a far more laissez-faire attitude than their counterparts. The pack increases its pace, and the R8 demonstrates some impressive agility in the transitions between turns.

Which brings us to the Mulsanne straight. This isn't a straight anymore—it's broken up by two chicanes that were put in to cut the ludicrous speeds being achieved in the 1980s. But the gaps between these kinks are still long enough to establish that the new R8 is as fast as the physical implications of its power and weight suggest. We see an indicated 260 km/h (162 mph) before braking for the first chicane.

The chicanes and the three moderately famous low-speed turns that follow—Mulsanne, Indianapolis, and Arnage—also demonstrate that the new R8 feels far more neutral under power than before. Even with the stability-control system switched to its more lenient sport mode, it welcomes big throttle inputs that would have slewed the back of the old car. More sensible certainly, and proof of the quicker reactions of the clutch pack, but also slightly less fun.

So what have we learned? That Le Mans is a great track, and that even a single lap there is momentous. And that the new R8 is very fast and very grippy and more grown-up than its predecessor. It sounds good, too, although we can't tell you anything about how it feels doing anything other than charging flat-out around a racetrack.

A great first impression, but we're looking forward to that second date.



SPECIFICATIONS

VEHICLE TYPE

MID-ENGINE, 4-WHEEL-DRIVE, 2-PASSENGER, 2-DOOR COUPE

BASE PRICE (EST)

\$170,000–\$190,000

ENGINE TYPE

DOHC 40-VALVE V-10, ALUMINUM BLOCK AND HEADS, PORT AND DIRECT FUEL INJECTION

DISPLACEMENT

318 CU IN, 5204 CC

POWER

540 OR 610 HP @ 8250 RPM

TORQUE

398 OR 413 LB-FT @ 6500 RPM

TRANSMISSION

7-SPEED DUAL-CLUTCH AUTOMATIC WITH MANUAL SHIFTING MODE

DIMENSIONS

WHEELBASE: 104.3 IN

LENGTH: 174.3 IN

WIDTH: 76.4 IN

HEIGHT: 48.8 IN

CURB WEIGHT

3500–3550 LB

PERFORMANCE

(C/D EST)

ZERO TO 60 MPH

3.1–3.4 SEC

ZERO TO 100 MPH

7.0–7.4 SEC

1/4-MILE: 11.3–11.7 SEC

TOP SPEED: 199–205 MPH

FUEL ECONOMY

(C/D EST)

EPA CITY/HWY

14/23 MPG


NEXT MONTH: A VASTLY
LONGER DRIVE OF
THE AUDI R8
ON SALE SEPTEMBER 8

THE MOST HYPED SOFTWARE OF THE YEAR

APPLE vs. ANDROID

by Alexander Stoklosa

The term “infotainment,” despite being a marketing portmanteau that makes our eyes roll, does neatly sum up the increasing variety of human-machine interfaces that dominates today’s dashboards. Now, Silicon Valley has leapt into the infotainment fray with technology that promises to simplify the often contentious relationship between man and modern machine. New phone-mirroring software from Apple and Google beam their mobile operating systems—redesigned with fewer apps for the car—from your phone to the vehicle’s central display. Automakers are rushing to adopt these phone-integration systems, dubbed Apple CarPlay and Android Auto, both to appear hip and to keep drivers’ hands on steering wheels where they belong. Having sampled both phone-mirroring solutions, we can report the following:

VOICE COMMANDS RULE: SIRI’S RIGIDITY REQUIRES THAT QUERIES BE SUBMITTED JUST SO; ANDROID ANSWERS TO A MORE NATURAL CROONING.



	ANDROID AUTO	APPLE CARPLAY
COMPATIBLE APPS	20	17
BUILT-IN APPS	Phone, Music, Google Maps, Hangouts	Phone, Music, Apple Maps, Messages, Podcasts, and iBooks
MUST-HAVE APPS	Google Maps, Google Now	Spotify, Messages
APPS WE WISH WERE COMPATIBLE	Google Docs, Waze	Google Maps, Waze
VOICE ACTIVATION	Yes, via Google	Yes, via Siri
WEATHER UPDATES	Yes, via Google and visible tile	Yes, via Siri
REQUIRES STANDALONE APP	Yes, the Android Auto app	No

OUR VERDICT

Any technology that takes more phones out of drivers’ hands is good. But both of these systems reduce distraction by reducing usefulness. As much as they promise phone mirroring, they don’t really work like your phone. The only key

functions, for example, that allow touch-screen inputs for swiping, scrolling, and button selection outside the main-screen icons are in the music apps (song and playlist libraries) and phone apps (contacts, recent calls, etc.). And though both CarPlay and Android Auto provide a familiar visual context

for voice-to-text or navigation instructions, on the whole, neither feels especially beneficial. Most new cars already offer voice-to-text or voice commands, and some even offer Apple Siri integration. That leaves the ability to beam navigation to the car’s screen (provided the car lacks factory

nav) as the most notable reason to use CarPlay or Android Auto. Even then, Google Maps is strictly compatible with Android Auto while CarPlay is stuck with the crummier Apple Maps. Waze and its critical cop-locating feature isn’t compatible with either, so you’ll still be staring at your phone to use this popular

driver’s tool. For this reason, and for Android’s integration of the creepy-but-useful Google Now predictive software—it “learns” your life patterns before displaying suggested routes home, weather and traffic updates, calendar reminders, etc.—we’re giving the nod to Android Auto.



THE TALE OF THE 2016 TRAVERSE

AS TOLD FROM THE SAFETY OF THE DRIVER SEAT.

We sat down with Scott Thomas, one of the inventors of the industry-first Front Center Air Bag¹ available in the 2016 Chevrolet Traverse. Scott's career in safety restraints spans more than 25 years and 50 patents. He always has customers in mind, and the Front Center Air Bag is an embodiment of his hard work.



SCOTT THOMAS

SENIOR STAFF ENGINEER,
ADVANCED RESTRAINT SYSTEMS

What sparked a need for the Front Center Air Bag?

Safety is critical to our customers and to us. This inflatable technology was developed to assist the safety belt by providing inflatable coverage to drivers and front seat passengers in far-side impact crashes where the affected occupant is on the opposite, non-struck side of the vehicle.

Why is the Front Center Air Bag so revolutionary?

It's unique. When deployed, the air bag may either help restrain the driver or cushion between occupants. What differentiates this air bag from all others is that it can position itself between the front occupants and it may also provide a level of restraint to the driver while having little surrounding surface for the bag to push against.

Why was it placed in the driver seat?

The driver seat was by far the preferred option. Other locations in the vehicle don't move or track with the driver. No matter how the seat is adjusted, the air bag remains adjacent to the driver.

How is the restraint function accomplished?

The cushion has an inflated tubular structure to resist lateral bending. No other air bag has this. It also has two tethers that help curve the cushion toward the driver to functionally catch the driver in some impacts, similar to catching a ball with a baseball mitt.

SEE IT IN ACTION AT CHEVY.COM/TRaverse-SAFETY

FIND NEW ROADS™

¹ Air bag inflation can cause severe injury or death to anyone too close to the air bag when it deploys. Be sure every occupant is properly restrained.

Bentley

Bentayga: The big news at Bentley is indeed big. The brand's first SUV has remained under wraps ahead of its Frankfurt auto show unveiling. Psst—it will look a lot like a two-row luxury SUV with the face of a Bentley Continental/Flying Spur. The Bentayga will sprint to 100 km/h (62 mph) in less than five seconds, we're told, and top out at 170 mph, at which point it will have the momentum of a small planet. This leather-lined mud machine is powered by an updated W-12 engine, with port and direct injection along with a couple of turbos combining to produce "more than 550 horsepower." It rides on air springs adjustable to four different heights and can tow more than 7000 pounds, says Bentley, so it should be popular with carnival corn-dog vendors. Using the Volkswagen Group's SUV platform, the Bentayga's body will be built in Bratislava, Slovakia. Final assembly will be

in Crewe, England. The Bentayga goes on sale early next year for more than \$200,000.



Continental GT: The bestselling Bentley gets a more powerful 6.0-liter W-12 engine (with 582 horses) and a cylinder-deactivation system that improves fuel economy (up to an EPA-combined 20 mpg). Minor styling tweaks, including fender vents with vaguely B-shaped chrome inserts, obtain. The GT comes with onboard Wi-Fi and is offered with a new leather color named Shortbread that is sure to be buttery and delicious. Convertible and V-8-powered versions are still available.

BMW M6 coupe



Flying Spur: Bentley's junior sedan gets the same W-12 engine with cylinder deactivation as the Continental, plus new wheels and interior frippery. And, yes, Shortbread will also be served.

Mulsanne: A new version of this luxury freighter, the Mulsanne Speed sees the old 6.8-liter V-8 pumped up to 530 horsepower and 811 pound-feet. It also gets a reprogrammed eight-speed autobox.

BMW

3-series/M3: What looks on the surface to be a moderate mid-cycle update—new LED head- and taillights and new fascias—in fact hides some important mechanical upgrades. The 3-series' steering, front struts, and rear dampers are retuned for better handling, answering some

long-standing complaints with the F30 generation. Six-cylinder models switch to an all-new straight-six, the B58, from BMW's new modular-engine family. The B58 outguns the old N55 by 20 horsepower and 30 pound-feet, with 320 and 330, respectively. In recognition, the model name gets nudged up 5, to 340i. Manual transmissions add automatic rev matching. A new plug-in-hybrid 330e will be a late add and pair a 2.0-liter four with 22 miles of electric range. The wagon carries on in its four-cylinder-only form, and while the M3 gets the new lights, it is otherwise unchanged.

6-series/M6: The pressure to improve is relentless, but the 6-series is already gorgeous. So, for its 2016 face lift, BMW simply pulled a vertical slat from each of the grille's kidney

beans, reshaped the rest, and tucked in a new fascia below. Six-cylinder models now have a switchable sport exhaust.

7-series: It may not look it, but the 7-series is all-new for 2016. Along with aluminum and high-strength steel, the body shell also employs structural carbon fiber in the roof, pillars, windshield header, and transmission tunnel. The 445-hp V-8 returns unchanged, while the 3.0-liter straight-six is, as in the 3-series, the new B58 with 320 horses. The 740e xDrive uses the same plug-in-hybrid system as the X5 and the 3-series, too. We expect the V-12 and Alpina B7 to return in a year or so. Available luxury ideas stolen from other brands include a scent diffuser and an etched-glass sunroof with LED lighting to mimic the night sky. Original ideas include

BMW 750i



A WORK BOOT THAT WEARS LIKE A COFFEE BREAK.



CARBONMAX 
NANOTECHNOLOGY SAFETY TOE

It's the safety-toe, reimagined. The Wolverine CarbonMAX® safety-toe uses nanotechnology to produce a strong, lightweight and more comfortable boot. The result of years of scientific research, it's one of the first safety-toe boots that feels nothing like a safety-toe, and makes even the toughest work feel lighter all day long. See the new line at wolverine.com/carbonmax.

WOLVERINE 
MADE TRUE *since 1883*

Buick Cascada



gesture controls that let the driver work the radio and phone by waving a hand near the center stack.

Alpina B6 xDrive

Gran Coupe: Behind the same updated grille and fascia as the regular 6-series, the Alpina B6 now wields an even 600 horsepower and 590 pound-feet of torque, increases of 60 and 50, respectively. The eight-speed automatic and four-wheel-drive system are unchanged.

X1: Just three years after it first appeared in the U.S., BMW's littlest crossover is undergoing the biggest redesign possible. What used to be based on a rear-drive architecture with shades of E90 3-series in its DNA is now based on a front-drive platform shared with the Mini Cooper. While enthusiasts might miss the old X1's rear-drive dynamics, everyone should appreciate the comparatively cavernous interior. With 55 cubic feet up front and 47 in the rear, the X1 out-biggens the Audi Q3 and Mercedes-Benz GLA in passenger accommodations, and its 27 cubes of cargo

space is almost as big as the Audi's and Benz's combined. BMW won't be mounting its inline-six transversely, meaning the only engine is a 2.0-liter turbo four. An eight-speed auto will be the only trans, and the X1 will be available only with four-wheel drive at launch. A front-drive X1 sDrive28i will appear later.

X5: The plug-in powertrain also seen in the 3- and 7-series makes its way into the X5 xDrive40e. In the heavier SUV, it's only good for 13 miles of electric range, although BMW says its 308 horsepower and 332 pound-feet will net a zero-to-60 sprint of just 6.5 seconds.

Minor trim changes:

2-series, 3-series GranTurismo, 4-series, 5-series, i3, i8, M4, M5, X3, X4, X6, Z4

Unchanged: X5 M, X6 M

Bugatti

Dead: Veyron 16.4 Grand Sport/Vitesse. Bugatti itself is merely hibernating until its next affront to every guy out here just trying to make a living, a.k.a. the Chiron, rolls out of Alsace for 2017.

Buick

Cascada: Cloned from the Opel model of the same name, the Cascada (Spanish for waterfall) joins the Buick lineup early next year. Although it shares its architecture with the Verano sedan, the shapely four-seat droptop has a slightly longer wheelbase (106.1 inches), as well as a new-for-Buick, 1.6-liter turbo four making 200 horsepower and 206 pound-feet of torque (221 pound-feet with overboost). The front-wheel-drive convertible comes with

a six-speed automatic only. Standard are 20-inch wheels and GM's HiPer Strut front suspension, which helps mitigate torque steer. Expect a fair amount of available luxuries, along with a traditional fabric roof that can be lowered in 17 seconds when driving at speeds up to 31 mph. Buick has yet to finalize pricing, but figure on a starting point between \$30,000 and \$35,000.

Minor trim changes:

Enclave, Encore, LaCrosse, Regal

Unchanged: Verano

Cadillac



ATS/ATS-V: All versions of the ATS (along with every other 2016 Cadillac except the SRX) will get

updated CUE infotainment systems that incorporate a faster processor, simplified nav-screen controls, and integration of Apple CarPlay and Android Auto interfaces [see Tech, page 042]. And all ATS models will now be offered with GM's Hydramatic eight-speed in place of the current six-speed slushbox. But the best news for Cadillac's compact is the introduction of the fairly magnificent V versions. Available with a six-speed manual or an eight-speed automatic and in two- or four-door forms, the ATS-V is Cadillac's BMW M3/M4 challenger. With the sweetest chassis and steering in the segment, the 464-hp Caddy is just the thing for back-road bombing.

CTS/CTS-V: The middle-rung CTS sedan gets the same CUE updates as the rest of the brand and a standard eight-speed automatic. We worry that it will still go unnoticed by the mass of Euro-sedan buyers.

For CTS-V road test, see page 048

BMW X1



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¹\$70 MAIL-IN REBATE INCLUDES GRABBER™, GRABBER™ AT™, G-MAX™ AS-03, GRABBER™ HTS60, GRABBER™ HTS, GRABBER™ STX, GRABBER™ UHP

²\$50 MAIL-IN REBATE INCLUDES ALTIMAX™ ARCTIC, ALTIMAX™ HP, ALTIMAX™ RT, ALTIMAX™ RT⁴³, EVERTREK™ RTX, AMERITRAC™, AMERITRAC™ TR, GRABBER™ AW, GRABBER™ HP, GRABBER™ TR

³GIFT WITH PURCHASE/MAIL-IN REBATE OFFER: VALID ONLY WITH QUALIFIED PURCHASE MADE IN THE FORTY EIGHT (48) CONTIGUOUS CONTINENTAL U.S. AND D.C. BETWEEN 8/10/15 AND 9/11/15 OR WHILE SUPPLIES LAST. NO RAIN CHECKS. VALID WITH THE ORIGINAL, DATED, PAID RECEIPT FOR THE PURCHASE OF FOUR (4) NEW QUALIFYING GENERAL TIRE PASSENGER OR LIGHT TRUCK TIRES FROM A PARTICIPATING RETAIL DEALER. OFFER MAY NOT BE COMBINED WITH ANY OTHER OFFER, DISCOUNT, REBATE, OR PROMOTION. TIRES MUST BE PURCHASED IN A SINGLE TRANSACTION. OFFER FORM MUST BE POSTMARKED OR SUBMITTED ONLINE BY 10/1/15. OFFER NOT VALID ON PURCHASES BY WHOLESALERS, DEALERS, FLEETS, OEM CUSTOMERS, OR OTHER COMMERCIAL ENTITIES. REQUESTS FROM THOSE WITH AN INVALID OR UNDELIVERABLE MAILING ADDRESS WILL BE DENIED. LIMIT TWO (2) GENERAL TIRE VISA® PREPAID CARDS PER HOUSEHOLD. THIS CARD IS ISSUED BY CENTERSTATE BANK OF FLORIDA, NA PURSUANT TO A LICENSE FROM VISA U.S.A., INC. NOT RESPONSIBLE FOR LATE, LOST, STOLEN, MISDIRECTED, ILLEGIBLE, MUTILATED, OR POSTAGE DUE MAIL OR INABILITY TO CONNECT TO WEBSITE. VOID IN ALASKA AND HAWAII AND WHERE RESTRICTED OR PROHIBITED BY LAW. ANY TAXES, FEES OR COSTS ARE SOLE RESPONSIBILITY OF RECIPIENT. ALLOW 8-12 WEEKS FOR FULFILLMENT. PREPAID CARDS WILL NOT HAVE CASH ACCESS AND CAN BE USED EVERYWHERE VISA DEBIT CARDS ARE ACCEPTED. EACH TIME YOU USE THE CARD, THE AMOUNT OF THE TRANSACTION WILL BE DEDUCTED FROM THE AMOUNT OF YOUR AVAILABLE BALANCE. CARD WILL BE ISSUED IN THE NAME ON THE REDEMPTION FORM ONLY. CARD EXPIRES AFTER 6 MONTHS, SUBJECT TO APPLICABLE LAW. CARD IS NON-TRANSFERABLE AND NON-REFUNDABLE. TERMS AND CONDITIONS APPLY TO THE PREPAID CARD. SEE PREPAID CARD FOR DETAILS. VISIT WWW.GENERALTIRE.COM FOR REDEMPTION FORM AND COMPLETE OFFER CONDITIONS AND RESTRICTIONS. WARNING: TAMPERING WITH, ALTERING, OR FALSIFYING PURCHASE INFORMATION CONSTITUTES FRAUD AND COULD RESULT IN STATE AND FEDERAL PROSECUTION.

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VELOCITY

THE CADILLAC CTS-V IS A
SCREAMING SUPERSEDAN OUT
TO TEAR THE LEGS OFF
THE GERMAN COMPETITION.

by Don Sherman

PHOTOGRAPHY BY A.J. MUELLER



CARANDDRIVER.COM . SEPTEMBER 2015 . 049

RAPTOR

eed we remind you these are seriously twisted times? Without prompt intervention, Bartholomew JoJo Simpson, that lovable fourth-grade cartoon cutup, will never see his 11th birthday. Homer is dumping Marge for a younger woman. Former down-home darling Miley Cyrus might be the instrument of some secret society. And in our own world, zero-emission vehicles are vying for garage space with modern muscle cars.

What we need to weather this maelstrom is a car we can trust. Something fast and fun, an automobile suitable for commuting that will broom cerebral cobwebs with every brush of the right pedal. An American Pharoah, if you will.

Cadillac has raised both hands to answer this call. With a decade of V models under its belt, a division boss who understands the fast-four-door gambit (after having helped Audi master it), and the General's steadfast backing, the redesigned and newly wreathless crest is ready to play supersedan hardball courtesy of its third-generation CTS-V.

This segment could use a spritz of vitality. Jaguar has sold its meager allotment of XFR-Ss. Lexus's new GS F lacks sufficient firepower. A Porsche Panamera with competitive gusto costs \$142,295. That leaves only the Audi RS7, BMW M5, and Mercedes-AMG E63 S on Cadillac's dartboard.

Caddy's dart is built on an efficient Alpha platform evolved from the ATS. A supercharged and intercooled 6.2-liter LT4 V-8 borrowed from the Chevy Corvette Z06 provides a healthy 640 horsepower at 6400 rpm and 630 pound-feet of torque at 3600 rpm. Smart electronic controls regulate the eight-speed automatic transmission, electrically assisted power steering, magnetorheological dampers, and limited-slip differential. There's enough Brembo braking capacity here to slow a locomotive. Recaro sport seats and Michelin Pilot Super Sport tires on forged aluminum wheels enhance traction inside and underneath. A smattering of carbon-fiber components, including the hood, help the CTS-V beat the curb weights of its enemies by 100 to 600 pounds. This is pharmaceutical-grade stuff.

To prove that its track-day stamina isn't hollow braggadocio, Cadillac turned us loose on Road America's four-mile circuit where we topped 140 mph three times per lap. This was the ideal venue to learn the CTS-V's finer points. First lesson: Don't try



CADILLAC CTS-V

+
INCREDIBLE
POWER, POISE, AND
PERFORMANCE.

-
STEERING IS LIGHT
ON FEEDBACK,
DOOR MAKES AN
UNCOMFORTABLE
KNEE BRACE.

=
A VERY SCARY
SEDAN, BUT ONLY
IF YOU HAPPEN TO
BE EMPLOYED BY
MERCEDES-AMG,
BMW'S M DIVISION,
OR AUDI'S QUATTRO
GMBH.

to outsmart the gearbox by clicking the paddle shifters. Simply leaving the console shifter in D in any driving mode above Tour runs the engine to within 200 rpm of the 6500-rpm redline before upshifts, while also providing the right gear for hustling out of bends. We observed the CTS-V's astute Performance Traction Management system adjusting power and differential lock-up to modulate understeer during turn-in and oversteer when exiting turns. Our third discovery is that the real fun comes in PTM's Race mode when all the well-intentioned assist systems are mostly dormant. The trick is to trail the brakes entering a corner so the front tires don't wash out; then you carefully add throttle in the middle of the turn to avoid wagging the tail. One of the CTS-V's most endearing traits is the reserve built into the last 10 percent of accelerator-pedal travel. Saving that booster rocket for the corner exit rewards you with big speed at the end of the straight.

Working the quick, hefty steering is the best isometric exercise you can enjoy sitting down, though you must concentrate to sense the faint feedback from the front tires. In the interest of maximizing hand-to-wheel and butt-to-bucket grip, don't skip the \$300 faux-suede steering wheel and shifter covers or the \$2300 Recaro front seats. Note to Cadillac: A more congenial surface for bracing a left knee against the door panel would be welcome.

Given the CTS-V's two-ton-plus heft, you'd think that carbon-ceramic brakes would be handy for track-day expeditions. Chief engineer Tony Roma and Brembo engineer Benjamin Pohl acknowledge that such an option was considered but rejected on cost grounds and the desire to configure the base car in track-ready form. Instead of complicating the CTS-V with two brake packages, Cadillac set a goal of providing enough thermal capacity to support two fuel tanks' worth of uninterrupted track lapping without overheating the brakes. To achieve that objective, the six-piston front and four-piston rear calipers grab four of the largest vented-iron rotors in captivity. The fronts are 15.4 inches in diameter, the rears 14.4. The pedal feels



NEXT MONTH:
THE V SLAYS AT
LIGHTNING LAP
ON SALE
SEPTEMBER 8



shell is positively ingotlike. Acoustic glass, sound deadening, and a nicely tuned suspension system filter out extraneous noise to support genteel conversation at 100 mph. It's no mere Corvette with a back seat: This new CTS-V performs well enough to send the Germans back to their dyno cells while simultaneously raising the speed-luxury stakes.

After whining incessantly about Cadillac's poorly executed CUE infotainment gear, we're elated to report that major amends have been made. The main eight-inch infotainment touch screen is smarter and quicker-responding thanks to a new processor. Other bonuses: A color head-up display is standard, and a reconfigurable 12.3-inch digital instrument cluster lights up with a high-contrast black-on-white tachometer in performance-driving modes. The \$1300 Performance Data Recorder stores your best laps for replay, both in the car and via laptop during cocktail hour. Apple's CarPlay can be routed directly to the CUE screen, and Android Auto will be available shortly.

A breakthrough supersedan is what you get when you turn a dedicated bunch of racers loose on a liberal budget. The speed affliction runs deep here. Chassis-development engineer Drew Cattell competes in endurance karts and an American Sedan Chevy Camaro. Brian Wallace, the engineer who proved this Cadillac could top 200 mph, raced with his father, Tom Wallace, a former Corvette chief engineer. Lead V-series development engineer John Buttermore won two SCCA Touring class national championships. Tony Roma climbed GM ranks through high-performance V-8 engine development, Cadillac's endurance-racing program, and the Camaro ZL1 launch. He's road-raced everything from an MG Midget to a Pontiac Firebird. And Cadillac president Johan de Nysschen is no stranger to victory champagne, having celebrated 10 Le Mans 24-hour race victories during his 19 years at Audi. In such a stormy world, a seasoned crew like this restores our faith.

Lighter and leaner than America's other speed hero, the Dodge Charger SRT Hellcat, the CTS-V stands ready and, based on this test, able to match wheels with Europe's hottest. Next stop: a bare-knuckle, over-the-road smackdown to determine which supersedan deserves the C/D crown.

happy in its work, with deceleration directly proportional to the applied pressure and minimal droop during hot lapping. Bolted-in aluminum centers save weight, and a patented ferritic nitro-carburizing process (heat treating in a nitrogen-rich atmosphere) improves durability while discouraging corrosion.

Considering the 640 horsepower leaving the crankshaft at 6400 rpm, this pushrod small-block is surprisingly quiet. There's minimal supercharger whine and redline ruckus. What you hear is the growling stomach of a bear rousing from a long winter's nap. Outside the cabin, the din is more like an F/A-18 with afterburners lit. To take the edge off engine noise, Cadillac installs a muff at the rear of the Eaton TVS supercharger and programs the Bose sound system to neuter the harsh notes. The muffler-bypass valves are closed during start-up to avoid angry 6 a.m. calls from exasperated neighbors.

With Ferrari-grade power, intelligent traction management, and Michelin's finest 19-inch radials on tap, we expected an exemplary performance with the test gear strapped on. Sure enough, the new CTS-V clicked off a run to 60 mph in 3.6 seconds on its way to 100 mph in only 7.5 seconds. The quarter-mile ticket—124 mph in 11.8 seconds—spots this car in the thick of the quickest imported sedans. Belying its 4129-pound curb weight and heavily laden front tires, this Cadillac corners at 0.98 g. Stopping from 70 mph in 149 feet without fade during repetitive braking tests, it beats two of the three Germans in its gun sight. Launch control is so effective that we struggled to beat it with the feature disabled. And the leap from 50 to 70 mph during our passing test is a grand jeté from eighth to third gear requiring just 2.1 seconds.

The greater surprise is the CTS-V's poise in ordinary driving. Adaptive dampers deftly curb body motion without spoiling the ride, so cruising most roads feels like rolling across freshly groomed putting greens. Neither swell nor heave catches this chassis out. Reinforced by stiff castings, plates, and tubular struts galore, this body

THAT WHITE TACH MEANS THIS CTS-V IS IN ATTACK MODE. THE NON-PUNCHED CUE SCREEN INDICATES THE '16 UPDATE.



CADILLAC CTS-V

▼ SPECIFICATIONS

PRICE
AS TESTED \$95,290
BASE \$84,990

VEHICLE TYPE: front-engine, rear-wheel-drive, 5-passenger, 4-door sedan
OPTIONS: carbon-fiber package, \$5500; Recaro seats, \$2300; Performance Data Recorder, \$1300; polished wheels, \$900; sueded steering wheel and shifter covers, \$300
STANDARD: power windows, seats, and locks; remote locking; cruise control; tilting and telescoping steering wheel
AUDIO SYSTEM: satellite radio; minijack, 3 USB, media-card, and Bluetooth-audio inputs; 13 speakers

ENGINE
 supercharged and intercooled V-8, aluminum block and heads
BORE X STROKE 4.06 x 3.62 in, 103.3 x 92.0 mm
DISPLACEMENT 376 cu in, 6162 cc
COMPRESSION RATIO 10.0:1
FUEL DELIVERY SYSTEM direct injection
SUPERCHARGER Eaton R1740 TVS
MAXIMUM BOOST PRESSURE 9.4 psi
VALVE GEAR: pushrods, 2 valves per cylinder, hydraulic lifters, variable intake- and exhaust-valve timing
REDLINE/FUEL CUTOFF 6500/6600 rpm
POWER 640 hp @ 6400 rpm
TORQUE 630 lb-ft @ 3600 rpm

★ NOTABLE HIGHLIGHTS

A large aluminum shear plate stiffens the front body structure while also smoothing underbody airflow. Spherical bearings in the front suspension links improve steering response.

DRIVETRAIN

TRANSMISSION 8-speed automatic with manual shifting mode
FINAL-DRIVE RATIO 2.85:1, limited slip

GEAR	RATIO	MPH PER 1000 RPM	MAX SPEED IN GEAR (rpm)
1	4.56	5.9	39 mph (6600)
2	2.97	9.0	59 mph (6600)
3	2.08	12.8	85 mph (6600)
4	1.69	15.8	104 mph (6600)
5	1.27	21.1	139 mph (6600)
6	1.00	26.7	176 mph (6600)
7	0.85	31.6	200 mph (6325)
8	0.65	41.0	190 mph (4625)

EXTERIOR DIMENSIONS

WHEELBASE	114.6 in
LENGTH	197.7 in
WIDTH	72.2 in
HEIGHT	57.2 in
FRONT TRACK	62.1 in
REAR TRACK	61.2 in
GROUND CLEARANCE	5.1 in

INTERIOR DIMENSIONS

SAE VOLUME	F: 61 cu ft R: 42 cu ft
TRUNK	14 cu ft

CHASSIS

unit construction with a rubber-isolated rear subframe

BODY MATERIAL: steel stampings, carbon fiber-reinforced plastic

STEERING

rack-and-pinion with variable ratio and variable electric power assist

RATIO 15.5-11.2:1

TURNS LOCK-TO-LOCK 2.3

TURNING CIRCLE CURB-TO-CURB 40.3 ft

SUSPENSION

F: ind, strut located by 1 diagonal link and 1 lateral link, coil springs, 5-position cockpit-adjustable electronically controlled magnetorheological dampers, anti-roll bar

R: ind; 2 diagonal links, 2 lateral links, and a toe-control link per side; coil springs; 5-position cockpit-adjustable electronically controlled magnetorheological dampers; anti-roll bar

BRAKES

F: 15.4 x 1.4-in vented disc

R: 14.4 x 1.1-in vented disc

STABILITY CONTROL fully defeatable, traction off, competition mode, launch control

WHEELS AND TIRES

WHEEL SIZE/CONSTRUCTION F: 9.5 x 19 in

R: 10.0 x 19 in/forged aluminum

TIRES Michelin Pilot Super Sport

F: 265/35ZR-19 (98Y)

R: 295/30ZR-19 (100Y)



CAR AND DRIVER TEST RESULTS

ACCELERATION

ZERO TO	SECONDS
30 MPH	1.5
40 MPH	2.2
50 MPH	2.8
60 MPH	3.6
70 MPH	4.4
80 MPH	5.3
90 MPH	6.3
100 MPH	7.5
110 MPH	9.0
120 MPH	10.5
130 MPH	13.6
140 MPH	14.8
150 MPH	17.4
160 MPH	20.7
170 MPH	25.8
ROLLING START, 5-60 MPH	3.8 sec
TOP GEAR, 30-50 MPH	2.0 sec
TOP GEAR, 50-70 MPH	2.1 sec
1/4-MILE	11.8 sec @ 124 mph
TOP SPEED (DRAG LTD, MFR'S CLAIM)	200 mph

■ **TEST NOTES:** Might be the best launch-control programming of any car with a torque-converter automatic. It can be matched with careful throttle manipulation, but not beaten. It'll hit 170 mph in less than one mile.

HANDLING

ROADHOLDING, 300-FT-DIA SKIDPAD **0.98 g**
UNDERSTEER MODERATE

■ **TEST NOTES:** Seems slipperier on the flat skidpad than on a racetrack. Understeer easily managed with throttle.

BRAKING, 70-TO-ZERO MPH

FIRST STOP	149 ft
SHORTEST STOP	149 ft
LONGEST STOP	153 ft
FADE RATING	NONE

■ **TEST NOTES:** This two-ton car is unfazed by repeated braking from triple-digit speeds. What the numbers don't tell you is this car did a 149-foot stop on its first and last stops. Suck it, fade! Carbon ceramic has nothing on this rotor, caliper, and tire setup.

WEIGHT

CURB	4129 lb
PER HORSEPOWER	6.5 lb
DISTRIBUTION F: 53.2% R: 46.8%	
CENTER-OF-GRAVITY HEIGHT	21.0 in
TOWING CAPACITY	0 lb

FUEL

CAPACITY	19.0 gal
OCTANE	91 recommended
EPA CITY/HWY	14/20 mpg (C/D est)

INTERIOR SOUND LEVEL

IDLE	50 dBA
FULL THROTTLE	83 dBA
70-MPH CRUISING	73 dBA

▼ COMPETITORS

AUDI RS7 (4.0-L V-8, 560 HP, 8-SP AUTO)

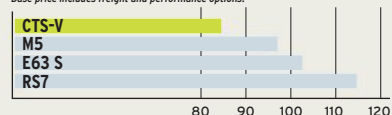
BMW M5 (4.4-L V-8, 560 HP, 7-SP AUTO)

CADILLAC CTS-V (6.2-L V-8, 640 HP, 8-SP AUTO)

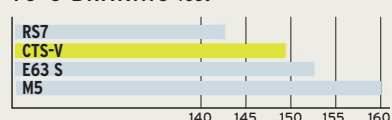
MERCEDES-AMG E63 S (5.5-L V-8, 577 HP, 7-SP AUTO)

CURRENT BASE PRICE dollars x 1000

Base price includes freight and performance options.



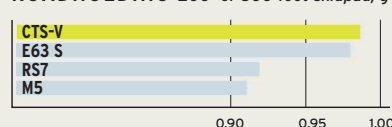
70-0 BRAKING feet



ACCELERATION 0-60 & 1/4-mile, seconds



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What owners say about V1...



★★★★★ Bill P., Phoenix, AZ

Where's the radar? An arrow lights up, pointing either Ahead, to the side, or Behind. And, amazingly, it's never wrong.



★★★★★ Arnie R., Atlanta, GA

So easy to operate, a box with one knob. No need to poke around at full-arm's reach for little buttons the size of rice grains.



★★★★★ Glenna R., Dallas, TX

Love the arrows! Where's the radar? They tell me every time. How come no other detector thought of that?



★★★★★ Chas S., Charlotte, NC

Situation Awareness you can trust. With the Radar Locator arrowing toward threats, and the Bogey Counter telling how many threats you face, V1 makes defense easy.



★★★★★ Cal L., Trenton, NJ

I've owned my V1 since 2001, and I've had it upgraded twice. I trust the arrows to point out every radar trap. When I know *where*, I know how to defend.



★★★★★ Ed H., Las Vegas, NV

How can anyone not be smitten by the Arrows? Radar ahead needs a different defense than radar behind. When I know where, I know what to do. And I can tell when I'm past the threat, too. All other detectors just *beep* and keep you guessing.



★★★★★ Rob R., Sacramento, CA

This is the slam dunk best radar detector. No databases to keep updating, or other "features" I'll never use. Instead V1 tells me the important stuff—the Bogey Counter tells you how many threats within range and the red arrows tell where they are.

Trust...V1 earns it one ambush at a time.



★★★★★ Harold B., Houston, TX

On my way home this afternoon I was following another detector user. I could see red blinking in his windshield as we went past the first radar. Thinking the danger was behind, Mr. Ordinary Detector User hit the gas.

Uh-Oh. V1's Radar Locator was showing two arrows, one pointing toward the trap now behind, and a second arrow ahead. The "2" on the **Bogey Counter** confirmed we were being double teamed.

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Cadillac CT6



CT6: Larger but allegedly no heavier than the CTS, Cadillac's new full-size rides on the freshly unwrapped Omega rear- and four-wheel-drive platform that will underpin a number of the brand's future models. At launch, the CT6 comes with the familiar turbocharged 2.0-liter four-cylinder, a new 3.6-liter V-6, and a twin-turbo 3.0-liter V-6. All engines will be mated to GM's eight-speed auto. Four-wheel drive is standard with the

V-6s; the 2.0-liter is rear-drive only. All-wheel steering comes standard across the board. The optional electronics could fill a Best Buy and include a night-vision system, a rearview mirror that doubles as a display screen for a rearview camera, and a 34-speaker (yes, 34) Bose stereo system. Eventually, a hybrid powertrain as well as a turbocharged V-8 will be offered. This Caddy goes on sale at the end of the year.

ELR: Cadillac's curiously pricey plug-in-hybrid coupe gets sportier and about \$10,000 less expensive for 2016. Thus, before federal tax credits, the 2016 ELR will cost about \$65,000. Cadillac has stiffened the suspension, recalibrated the steering, and modified the braking system in search of greater

driving pleasure. The division has increased total system horsepower (from engine and electric motors) to 233 from 217, good for a drop of about 1.5 seconds in zero-to-60-mph runs, according to Cadillac.

SRX: Not dead yet! There will be 2016-model SRX crossovers, but only a few months' worth of

them. An all-new model, the XT5, will replace it early next year. What we know so far: The two-row XT5 will get the company's new 3.6-liter V-6 (and likely a 2.0-liter turbo four).

Minor trim changes: Escalade/ESV, XTS

Chevrolet

Camaro: Hang up your jorts and trim that extra length of hair covering the backs of your necks, America—the Camaro just got fancy. All-new this year, America's greaser Corvette sheds more than 200 pounds, shrinks in every major dimension, and transitions onto the same fine-handling

Chevrolet Camaro



Alpha rear-drive platform that sits beneath the Cadillac ATS and CTS. Both a coupe and a convertible are available, with Chevrolet claiming that the droptop's weight penalty is just 55 pounds. Following the lead of its blood rival, the Mustang, the Camaro adopts a three-engine strategy that's nevertheless slightly different than Ford's hierarchy. Chevy starts the pricing with the turbocharged four-cylinder, moves to the V-6, and headlines with the requisite V-8; Ford puts the turbo in the middle. Camaro's turbo 2.0-liter is shared with the ATS and makes 275 horsepower, while the new 3.6-liter

V-6 is good for 335. Like nearly every other V-8-powered GM vehicle, the Camaro adopts the fifth-generation small-block that is featured in the C7 Corvette. Indeed, the 6.2-liter V-8 makes the same 450 horsepower here as it does in the Vette. Every engine can be had with either an eight-speed auto (GM's 8L45 with the 2.0- and 3.6-liters or 8L90 with the 6.2) or a six-speed manual. We've driven a prototype V-6 coupe and can report that the new Camaro does indeed drive smaller and lighter than its hulking (albeit athletic) predecessor, with accurate steering and a nicely balanced chassis. More pleasant

still, the six is quite burly, and a newly available active exhaust gives the middle Camaro a raspy, Jaguar F-type-like soundtrack. Customers loved the outgoing model's styling, so the new one's nearly indistinguishable skin is no accident. But the second-gen Camaro lovers on our staff find the styling changes a little too incremental.

Colorado: The mid-size pickup's long-awaited diesel engine finally arrives in October. Mated exclusively to a six-speed automatic, the optional 2.8-liter four-cylinder Duramax should achieve greater than 30 mpg on the highway while making

181 horsepower and 369 pound-feet of torque. The diesel joins the Colorado's standard gas-fed 2.5-liter four and optional 3.6-liter V-6, and will add a few thousand dollars to the truck's price.

Cruze: For the second generation of its global bestseller, Chevrolet

turned out a Cruze that's larger, more powerful, and more efficient than the car it replaces. Chevy says the car's significant 250-pound weight loss is the result of good old-fashioned design and engineering. Despite gaining nearly an inch of wheelbase and 2.7 inches of overall length, the



2.8-liter four-cylinder Duramax



Chevrolet Cruze



Cruze's still mostly steel body loses 53 pounds. The standard 1.4-liter turbo four, a member of GM's latest Ecotec family, produces 153 horsepower and 177 pound-feet of torque, which is more than the previous Cruze's optional turbo made. Yet the engine is 41 pounds lighter thanks to the move to an aluminum block. A full 24 pounds was stripped from the six-speed automatic transmission, and you can save even more by opting for the standard six-speed manual. And the sleek, handsomely styled wrapper has a slippery 0.29 drag coefficient. It all adds up to an estimated 40 mpg on the highway, no "Eco" package required.

Slip behind the Cruze's chunky steering wheel and you're faced with simple instrumentation and a gracefully swept dashboard design reminiscent of the new Malibu's. A seven-inch MyLink infotainment display compatible with Apple CarPlay and Android Auto phone-mirroring solutions is standard, and an eight-inch unit is optional. The wheelbase stretch opens up an extra two inches of kneeroom for

rear-seat passengers, but the expansion feels greater. Considering that the Cruze comes standard with an onboard 4G LTE data connection and a built-in Wi-Fi hotspot, one could legitimately fire up a laptop and get work done in the back. Rear occupants can even heat their bums if they'd like; heated rear seats are part of a slew of newly available upscale features. The safety roster has also been bolstered with blind-spot monitoring, lane-keeping assist, and forward-collision warning.

Will there be more variants? For now, Chevrolet is keeping it simple, promising only a return of the Cruze diesel for 2017. We hear that a hatch will join the fray, too.

Equinox: Hot in the running for Bestselling Vehicle that Flies Lowest Under the Radar, the Equinox is

given a refresh nearly as subtle as its existence, with the expected headlight, taillight, and fascia updates, as well as a remodeled interior. Chevrolet has streamlined the crossover's previously confusing trim-level structure to the simpler L, LS, LT, and LTZ heirarchy.

Malibu: Once nearly as boring as a minivan parade, the family-sedan field has transformed into a hotbed of style, driving satisfaction, and competition. Against such strong offerings as the Honda Accord and Mazda 6, the new Malibu's clean lines, new engines, and sumptuous interiors do their best to erase the memory of the outgoing model's Rent Me fatalism.

The Malibu has a new front-drive platform with a choice of two turbocharged

engines and an additional 3.6 inches of wheelbase (resulting in a 1.3-inch bump in rear legroom). A 1.5-liter four making 160 horsepower is standard, and a carry-over 2.0-liter is optional. The latter is 9 horsepower and 37 pound-feet weaker than before, for totals of 250 and 258, respectively. With both engines being less endowed than their forebears, it's a good thing the 'Bu loses about 300 pounds. Buyers not familiar with today's cheap gas prices can opt for the resurrected Malibu hybrid, which pilfers its electric bits from the new Volt plug-in hybrid but uses a more powerful 1.8-liter four in place of that car's 1.5-liter. A full complement of infotainment and safety technologies ensures that Chevy will have plenty of

acronyms to advertise, along with the hybrid's estimated 47 mpg combined.

Silverado 1500: Although it hasn't yet been confirmed, Chevrolet will refresh the regular-duty Silverado 1500 for 2016. Spy photos suggest that the industry-standard bumper, headlight, grille, and hood mid-cycle swap is in the cards, and don't be surprised if the Silverado's interior gets an upgrade as well. The powertrain lineup isn't expected to change.

Spark: Everything is relative, so when GM brags that the second-generation Spark minicar benefits from a 17-percent power increase, it deserves at least a Spark-sized asterisk. That's because the Spark goes from an 84-hp pipsqueak to, well, a sub-100-hp bantamweight. A

Chevrolet Malibu



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1.4-liter member of General Motors' new Ecotec small-engine family, the Spark's four-cylinder makes 98 horsepower. It should make the already-sort-of-fun-to-drive Spark even more so, even if the objective performance figures fall closer to the outgoing model's 11-second zero-to-60 times. Expanded active and passive safety features, more traditionally proportioned headlights, and fuel economy expected to break into the 40-mpg zone should improve the Spark's appeal, but the larger yet similarly priced Sonic remains a showroom distraction.

Trax: see comparison test, page 086

Volt: Entering its second generation amid plummeting gas prices, the Volt advances with a kilowatt of small but effective changes. Headlining the updates are a lighter-weight powertrain and a battery with greater capacity that's more efficient and capable of 50 miles of

Chevrolet Volt



electric-only driving. But perhaps the 2016 Volt's biggest advance is its lower base price: \$33,995 before applicable tax incentives or rebates. Factor in the fed's \$7500 EV tax credit and it's now possible to step into a Volt for \$26,495.

Minor trim changes: Corvette/Z06, Sonic
Unchanged: City Express, Express, Impala, Silverado 2500/3500 HD, Suburban, Tahoe, Traverse

Chrysler

300: The mid-level 300S continues with its 300-hp 3.6-liter V-6, versus the standard V-6's 292, but gains a sport-tuned chassis with revised springs, bushings, steering, and summer tires. To celebrate Chrysler's 90th anniversary, a

special package is available on Limited models. It includes a panoramic sunroof, top-spec infotainment features, remote start, and badges. Similar packages are available on the 200 and Town & Country.

Minor trim changes: 200, Town & Country

Dodge

Durango: Fuel-saving stop-start technology is now standard on Durangos equipped with the 3.6-liter V-6. An optional sport mode said to tweak steering assist, throttle response, and shift timing for sportier performance is available for the first time on all trims. The Citadel trim gets a monochromatic exterior package. A

Brass Monkey appearance package (20-inch burnished-bronze wheels, gloss-black grille, and more odd embellishments) will hit the Durango later in the year and taste of malt liquor and orange juice.

Viper: The ACR (American Club Racer) returns to add bite to the Viper. The massive tires (295/25R-19 front, 355/30R-19 rear) are specifically designed Kumho V720s that shroud six-piston calipers and 15-inch carbon-ceramic brake rotors. If that and adjustable Bilstein coil-overs aren't enough to tilt your kilt, maybe the optional Extreme Aero package will. Slated for late availability, it includes an adjustable dual-

element carbon-fiber wing, bespoke diffuser and hood, a detachable extension on the front splitter, and enough additional dive planes to sink a battleship. Did we mention the hand-built 645-hp V-10 under the hood?

Minor trim changes: Charger, Dart, Journey
Unchanged: Challenger, Grand Caravan

Ferrari

488GTB: see first drive, page 060

Minor trim changes: FF
Unchanged: California T, F12berlinetta
Dead: LaFerrari, 458 Italia, 458 Speciale, 458 Speciale A, 458 Spider

Fiat

500X: see comparison test, page 086

Minor trim changes: 500/500 Abarth/500C/500E, 500L



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A red Ferrari 488 GTB is shown from a side-rear perspective, driving on a paved road that curves into the distance. The background consists of rolling green hills under a clear sky. The car's sleek design, including its side mirrors and wheels, is clearly visible.

OUT

IN THE *FERRARI 488GTB*,
TURBOCHARGERS HAVE INFILTRATED
WHAT WAS ONCE THE INNER SANCTUM
OF PURE AUTOMOTIVE JOY.

by Aaron Robinson

PHOTOGRAPHY BY CHARLIE MAGEE



urbos! Two of them—two big snails of swoosh—have invaded the holy sanctum of a Ferrari engine compartment, and life will never be the same. Next thing you know, the future CEO of a publicly traded Ferrari, one Juan Wang Lipschitz or somebody, will pull the sheet off an SUV with matching carbon-fiber Apple watch and then, what the hell, we're in *Mad Max* and the whole world is fried.

Or are we being hysterical? Ferrari has exploited turbocharging before, both in motorsports and in the illustrious 288GTO and F40, beginning in 1984, and the California T. But its bestselling model, the 458 Italia, which was as close to a perfect plaything as any wheeled conveyance ever made, needed more power. Apparently. That's what they tell us, anyway. It's not Ferrari pushing this so much as the customers, those Ferragamo-shod masters of the universe who see progress only in numbers that go up. More power equals more speed equals more status equals more women equals more *la-di-da!* With Lamborghini, and especially McLaren, breathing down its neck, Fer-

rari felt it had to make a power statement with the 458 successor, but without turning the model into a big-bore gas hog. So it went turbo shopping.

The result is the 488GTB, not a wholly new car at \$242,737, but an evolution of the primarily aluminum 458. The 90-degree, four-cam, direct-injected V-8, called the F154 and featuring a crankshaft as flat as stale Lambrusco, is shared with the California T but is significantly altered. Taking advantage of its move aft of the cockpit, it enjoys a taller red—always red—intake plenum for more ram effect; optimized exhaust plumbing juicing larger turbos with titanium-aluminide turbines for faster spin-up; revised cylinder heads for better cooling; and more-robust pistons and rods. Displacement shrinks from the old 458's 4.5 liters to 3.9, but horsepower rises by 99 to 661 (more than



SPECIFICATIONS

VEHICLE TYPE
MID-ENGINE,
REAR-WHEEL-DRIVE,
2-PASSENGER, 2-DOOR
COUPE

BASE PRICE
\$242,737

ENGINE TYPE
TWIN-TURBOCHARGED
AND INTERCOOLED
DOHC 32-VALVE V-8,
ALUMINUM BLOCK AND
HEADS, DIRECT FUEL
INJECTION

DISPLACEMENT
238 CU IN, 3902 CC

POWER
661 HP @ 8000 RPM

TORQUE
561 LB-FT @ 3000 RPM

TRANSMISSION
7-SPEED DUAL-CLUTCH
AUTOMATIC WITH
MANUAL SHIFTING MODE

DIMENSIONS

WHEELBASE: 104.3 IN

LENGTH: 179.8 IN

WIDTH: 76.9 IN

HEIGHT: 47.8 IN

CURB WEIGHT: 3250 LB

PERFORMANCE
(C/D EST)

ZERO TO 60 MPH
3.0 SEC

ZERO TO 100 MPH
6.3 SEC

1/4-MILE: 10.5 SEC
TOP SPEED: 205 MPH

FUEL ECONOMY
(C/D EST)

EPA CITY/HWY
15/20 MPG

▲
ABOVE: LET'S FACE IT, THE
458 ITALIA'S THREE TAILPIPER
NEVER MADE SENSE ANYWAY.
TOP RIGHT: BETTER LIVING
THROUGH TURBOCHARGING.

the old Enzo!) while torque, which is never high enough in the typical short-stroke Italian screamer, ramps up by 163 pound-feet to 561.

Like a chef who doesn't use recipes, Ferrari is a company that has always seemed to operate by emotion and instinct, cooking its creations according to its own sense of purpose and history. Thus, the spicy meatballs, however flawed, always come from the heart. However, the 488GTB strikes us as much ado about market forces, emissions legislation, and spreadsheet numbers, starting with the aforementioned power figures. There are also the millisecond improvements to the throttle response and transmission shifts, the claimed 20 to 30 pounds shaved from the curb weight, the greater lateral and longitudinal acceleration figures, the thriftier fuel consumption, and the increased downforce.

As you can see, the new car looks familiar if a bit chunkier. The center section of the 488's aluminum space frame basically carries over from the 458, with only the front and rear sections changed to accommodate the new powerplant and its greater airflow needs. Thus, the wheelbase stays static at 104.3 inches, while length and width increase only slightly, the latter due to wider tracks.

Still, and despite efforts by the designers to squeeze in the body-side forms to create arrow-shaped sensuality around the two-tier side ducts, some of the elegant svelteness of the 458 got sacrificed as the rear bulked up to accommodate all the new plumbing. Hey, you wanted more power. Up front, the 458's flexible catfish whiskers were snipped off, replaced by a more generic-looking face (not necessarily a bad thing) with vanes to channel air underneath the car, plus a winged underbite like that on the F12berlinetta that sluices more air into the larger nose radiators.

Pull the small winglet serving as a door handle and the cockpit reveals itself as both steeped in leathery tradition and also new. As in the original 308GTB, the broad dash floats above it all, with no vertical center stack to anchor it to the open, flat floor. A Ferrari finally comes with a usable infotainment unit, featuring a handy multifunction dash knob controlling the various functions of the small binnacle screen. And Ferrari at last joins the rest of the industry in employing a keyless fob, so you just push the steering-wheel starter button to get the fires going.

We rolled out of the gate of the Fiorano test track in blanching summer sunshine and turned left for the Futa Pass, that winding black shoelace in the eastern Apennine Mountains. Ferrari gave

its engineers a mighty challenge by upping the power so drastically. Preserving subtlety and character gets more difficult as the dyno curves arc higher and everything else, from tires to control software, swells to match it. The 488's torque output is tremendous, the little 3.9 V-8 proving itself an incredibly hard worker as it pumps out huge thrust from 3000 rpm.

The wait for boost is there if you look for it, but it's so short and frosted over that you'll rarely notice. Once the manifold pressure builds toward the 20-psi peak, the engine rushes with even greater gusto for redline. The 8000-rpm circuit breaker comes up shockingly fast; you slam into it repeatedly while you're learning the car, all the red LEDs across the top of the steering wheel blinking like a Vegas signboard. You trip over redline far more often in the 488 than you ever did in the 458 with its extra thousand revs.

The flywheel effect is like that of a motorcycle's, which is to say almost nonexistent. Press down and the engine zings hard and fast. Lift off and it goes dead almost as suddenly, the boost bleeding off with a sigh. Track rats will love the throttle's tense directness, but daily drivers may find it tiresome.

And the scream? This engine doesn't quite as much. According to Ferrari, sound was one of the 488's most difficult challenges. Turbos are natural silencers, and the trick is to tune the intake and exhaust runners and shrink the other mufflers until you get back the magical wail of that flat-plane-crank V-8. Ferrari gets almost there, but the new car is definitely quieter, the sound a little more silken and less of a raw shriek than the 458's. Blame the lower redline, but the twin IHI turbos, which can also be heard as a soft but energetic breathing from behind you, also absorb some blare.

Meanwhile, none of the 458's steering sensitivity or grip is lost, the 488 gluing itself to corners with dogged neutrality. The magnetorheological shocks, redesigned with lower-friction rod seals, digest the road imperfections and keep the widened tires facedown and biting up to stupendous speeds. While the springs are firm—indeed as firm as those on the outgoing 458 Speciale, which is to say fairly rocklike—the engineers rewrote the software to change the shock mapping and better tie the suspension's workings into the car's other systems. Basically, “SSC 2” (Side Slip Control, Version Two) selectively dials



▲ ABOVE: DESPITE THE 488'S FLARED HIPS, IT RETAINS THE 458'S SLINKY PROFILE. ABOVE RIGHT: STEERING WHEELS ARE TURNING INTO AIRPLANE YOKES.

into the four shocks a little more give than before to make the street-compound Michelin Pilot Super Sports work better with the electronically controlled limited-slip differential, dual-clutch seven-speed, and stability-control system.

The result is a Ferrari that rides acceptably well over the worst Italian pavement but also surrenders none of its sharp reflexes. After reaching the Futa's 2963-foot summit, we headed back to the safe haven of Fiorano to confirm our driving impressions. The 488 is relentlessly neutral. Even with all that power, it doesn't want to slither too much out of a corner. Sure, it flinches when you're too hard on the gas, but it doesn't snap wide. Rather, it steps out in a pleasant and highly controllable ooze as the electronic diff works the tires for maximum grip. Nor does the GTB tuck in dramatically if you lift midcorner; the suspension doesn't stroke enough in the rigid, flat 488 to allow such load transfer and subsequent camber changes. It is just stable and neutral, tracking exactly where you steer until the tires can't take it anymore and the car slips slowly, gently sideways.

On the sports-car scale that has the cold blunderbuss Bugatti Veyron at one end as the ultimate car built entirely around numbers and the darty little Lotus Elise at the other, the old 458 occupied a beautiful middle ground. You get raw power but also a highly satisfying poise in the tight corners. It is a hard act to follow, having been arguably the best all-around sports car in the world. The refined 488 is largely a repeat, but it nudges Ferrari's mid-engined V-8 model in the direction of the Veyron.

When it comes to the horsepower question, Ferrari CEO Amedeo Felisa says every new model must be better, a somewhat superficial and enslaving imperative that one day may force the company to build cars that are stupendously fast but not fun. However, the fantastically sublime 488 proves that this is not that day. ■



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THE YEAR'S BEST USE OF THE ATMOSPHERE

AEROSMITHING

by Aaron Robinson

**Vortex of the Cortex**

Six curved fins on the underbody, mounted adjacent to the front tires, serve as vortex generators, increasing downforce.

The Ferrari 488GTB is as much a study in air management as it is a garage trophy. Twin turbos coax 661 horsepower from just 3.9 liters of V-8, which propels a form that provides 50 percent less drag with 50 percent more downforce than the 458, according to Ferrari. Here's how the new mid-engine Ferrari makes the air its ally:



Short Stack Two-tiered rear-fender intakes route upper airflow to the engine. What's not ingested there exits next to the taillamps to feed the wake and trim drag, while the lower flow gets ducted through two intercoolers.

**Playing Through**

What Ferrari calls a "blown rear spoiler" is a narrow fixed wing created by a slot in the body just aft of the rear glass; it directs air through to the tail to produce downforce.

**T for Three**

An "aero pillar" takes high-pressure air impacting the front of the car and deflects it beneath the flat floor and to the left and right radiators.



Flapping in the Wind High-mounted exhaust pipes enable a wide rear diffuser with six curved fins to spread the flow. Three hinged flaps between the fins automatically descend 17 degrees at high speed to diminish the diffuser's downforce, thereby reducing drag and lifting top speed. Ferrari claims more than 700 pounds of downforce at 155 mph.



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Ford Focus RS



Ford

Explorer: A restyled Explorer that should owe design royalties to the Range Rover is new for 2016. A 2.3-liter turbo four with 280 horsepower and 310 pound-feet of torque replaces the previous 240-hp 2.0-liter turbo four. A 290-hp 3.5-liter V-6 remains available. For the ultimate Explorer customer, there's the new Platinum trim level.

Focus RS: The hottest Focus takes on the VW Golf R and Subaru WRX STI with a 2.3-liter turbocharged four, four-wheel drive with torque vectoring, and a six-speed manual transmission. The RS's 345 horsepower and 325 pound-feet of torque will keep that clutch leg busy. A fresh body kit and a rally-car-ready rear spoiler cap off the Ken Block-approved styling. Pricing hasn't been announced, but

it should hit dealers with a sticker in the neighborhood of \$35,000.

GT: The star of the Detroit auto show, the GT is the follow-up to Ford's 11/10ths-scale model, from a decade ago, of the 1960s GT40s. A carbon-fiber tub with aluminum substructures at each end is wrapped in a carbon-fiber body that looks ready for the Le Mans grid, where it's headed in 2016. A twin-turbo 3.5-liter V-6 and seven-speed dual-clutch automatic are mounted astride the rear axle.

Carbon-ceramic brakes

and 20-inch wheels are standard. Inside, the seats don't move; the pedals and the steering wheel do. Hey, that's just like the Ferrari LaFerrari.

Shelby Mustang GT350/GT350R: If the RS and the GT haven't convinced you that Ford is getting serious about performance, well, then you, sir, are a cynic. And then there are the GT350 and GT350R. Both get the 5.2-liter flat-plane-crank V-8 that pumps out 526 horses and revs past 8000 rpm [see page 117]. There's no automatic available,

just a six-speed manual. Stopping the GT350 are big brakes with six-piston calipers up front and four-piston units in back. A track-ready chassis with new bushings, springs, anti-roll bars, shocks, and Michelin Pilot Super Sport tires works with a front splitter, a rear diffuser, and optional spoilers to keep the GT350 stuck to the ground. The GT350R is even more aggressive, adding carbon-fiber wheels and removing A/C, the rear seat, exhaust resonators, a tire-inflation kit, and trunk carpet. The weight-saving efforts remove 130 pounds from the GT350's curb weight. Also, a Shelby GT500 is allegedly due next year, in case you remain unsuayed.

Minor trim changes: C-Max/Energi, Escape, Expedition, F-150, F-series Super Duty, Fiesta/ST, Flex, Focus/Electric/ST, Fusion/Energi/hybrid, Mustang, Taurus/SHO, Transit, Transit Connect
Unchanged: Edge

GMC

Canyon: Like its Chevrolet Colorado cousin, the Canyon will get GM's four-cylinder 2.8-liter Duramax diesel (already in use overseas) for 2016 in an attempt to top 30 mpg in EPA highway testing. Trucks equipped with the four-pot diesel should arrive on dealer lots this fall.



Terrain: Now entering its sixth model year, this small (for GMC, at least) crossover gets a round of updates, including new front and rear fascias, LED daytime running lamps on upper trim levels, a revised center stack, some new interior and exterior color choices, and fresh 18- and 19-inch wheel designs.

Minor trim changes: Acadia, Savana, Sierra/HD, Yukon/XL

Ford GT





Hyundai
Veloster Turbo
R-Spec



Honda

Accord: To shift production from Ohio to Japan, Honda is granting the Accord hybrid a one-model-year break. Regular coupes and sedans get revised nose and tail treatments, new wheels, minor chassis improvements, and added driver assists. All 2016 Hondas have rearview cameras and Bluetooth connectivity.

Civic: The 10th generation of Honda's venerable compact sedan arrives this fall with an aggressive exterior design and a choice of naturally aspirated or turbocharged 1.5-liter direct-injected four-cylinder engines. A choice of six-speed manual or CVT will be available along with a comprehensive list of driver-aid technologies. The Civic coupe follows this winter.

CR-Z: Honda's mix of funk and fuel efficiency receives minor interior and

exterior alterations, an improved audio system, keyless entry, and push-button starting.

FCX Clarity: After a brief hiatus, Honda's fuel-cell sedan is due back next year with a more svelte body, enhanced performance, and a new name.

HR-V: [see comparison test, page 086](#)

Pilot: A comprehensive redesign of Honda's three-row crossover brings a new 3.5-liter direct-injected V-6

packing 280 horses with a six-speed automatic in lesser models, a nine-speed for top editions, and optional four-wheel drive. The upgraded navigation system is Garmin-powered.

Ridgeline: Rumors of its return are not exaggerated. Expect a blocky four-door pickup, powered by the new Pilot's 280-hp V-6, to roll next year as a 2017 model.

Unchanged: CR-V, Fit, Odyssey

its own look, but with front and rear fascias that are now somewhat less bizarre.

Tucson: Hyundai's small SUV trades its soft and curvy form for a look hewn of the hatchet. The new model, which is slightly wider and rides on a wheelbase extended by a little more than an inch compared with the previous Tucson, still starts with a 164-hp 2.0-liter four mated to a six-speed automatic. Eco, Sport, and Limited models

Emergency Braking and all the other electronic idiot-proofing aimed at keeping you from wandering about and hitting things.

Veloster: Hyundai's little nugget of asymmetrical 2-plus-1-door weirdness gets a new Rally Edition package for the Turbo R-Spec model. It comes with a stiffer suspension, 18-inch Rays wheels, carbon-fiber-look body accents, a B&M sport shifter, and

Dead: Accord plug-in hybrid, Civic hybrid/natural gas, Crosstour

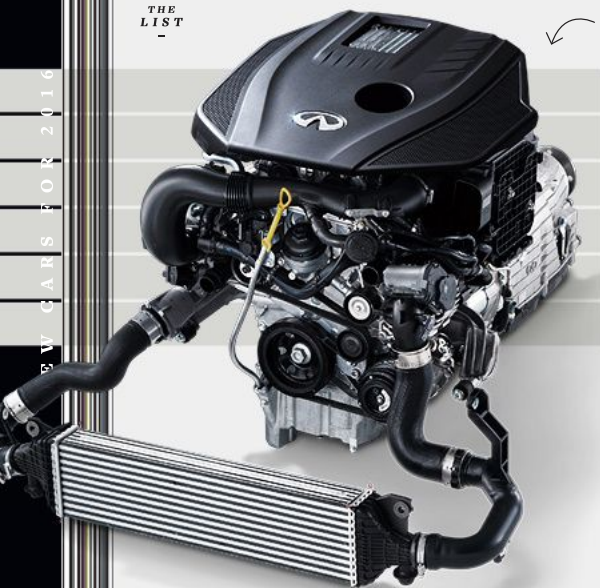
Hyundai

Sonata hybrid: Versus the 2015 Sonata hybrid, the all-new 2016 model has a larger-capacity lithium-polymer battery pack, a smaller-displacement engine (2.0 liters, down from 2.4), and a more powerful electric motor. The changes bring a boost in EPA combined fuel economy to 42 mpg from 38. As in years past, the hybrid gets

get a new turbocharged 1.6-liter four in place of the old optional 2.4-liter. What it gives up in displacement (0.8 liter) and power (7 horses), it gets back with 195 pound-feet of peak torque, outgunning the old non-blown four by 18 pound-feet. Mated to a seven-speed dual-clutch automatic, the new engine helps improve the Tucson's fuel economy, too. Naturally, the new Tucson is offered with four-wheel drive and a host of driver-assistance systems including Automatic

mandatory matte-blue paint. The non-Rally Edition Veloster Turbo switches out the optional six-speed dual-clutch automatic for a seven-speed autobox (a manual remains available). The model also gets trim changes inside and out, and an optional Tech package that includes HD radio, Apple Siri integration, and Blue Link connectivity.

Minor trim changes: Azera, Elantra, Genesis, Genesis coupe, Sonata
Unchanged: Accent, Equus, Santa Fe



↖ Infiniti 2.0-liter turbo four

Infiniti

– **Q30:** After a long gestation period, the Q30 goes on sale early next year as a 2017 model. This small hatchback is, deep down, a Mercedes-Benz A-class/CLA-class/GLA-class, but every body panel and interior doodad, and even the infotainment system, is distinctly Infiniti. The running gear is, as noted, borrowed from Benz, with a turbocharged 2.0-liter four providing motivation to the front wheels via a seven-speed

dual-clutch automatic. A Sport model adds a stiffer suspension plus body visuals intended to stir enthusiasts' loins. But the zestier iteration won't serve up any more power; every Q30 will come with roughly the same 208 horsepower and 258 pound-feet as the base CLA250.

– **Q50:** In addition to a few trim changes, the somewhat maligned Q50 is getting a shot in the arm. Or, really, a shot in the engine bay. The long-awaited 2.0-liter turbocharged four base engine finally arrives. Sourced from Mercedes-Benz but

built in the U.S., the engine should whip up about 250 horsepower. Of far greater interest is the new twin-turbocharged 3.0-liter V-6 that arrives later in the model year. Available in two strengths—nearly 300 horsepower and nearly 400 horsepower—the fresh six replaces the Q50's zippy but aging 3.7-liter "VQ" V-6. A proper test will reveal whether the new powertrain roster brings back some of the fun-to-drive attitude lost when the old G37 sedan became the Q50, but the modern engines are a step in the right direction.

– **QX30:** Infiniti says the QX30 crossover stands distinct from the new Q30 hatchback. In reality, the taller car is little more than a Q30 with a lift job and more body cladding. The two '30s share a common body shell, their engines, and nearly all their styling, but the taller one will offer four-wheel drive. Now guess which of the two will sell better.



QX50: Tracing the QX50's lineage brings one to the EX35, a small rear-drive crossover built, since 2007, on the second-generation G sedan's architecture. For 2016, Infiniti has swapped the U.S.-market QX50's body for the stretched Chinese version. The gift from everybody's favorite legroom-fetishizing supnation brings an additional 3.2 inches of wheelbase and a roomier back seat with four more inches of space.

– **Minor trim changes:** Q70, QX60

Unchanged: QX70, QX80

Dead: Q40, Q60, QX60 hybrid

Jaguar

– **F-type:** Jaguar joins our noble cause by making a six-speed manual transmission available on the 340-hp and 380-hp V-6 models. At the same time, standard four-wheel drive, a wholly unnecessary feature for a fair-

weather sports car, tames the wild eight-cylinder F-type. (Four-wheel drive is also optional with the high-output V-6 mated to the eight-speed automatic.) The V-8 convertible, formerly called the F-type V-8 S, now answers to the name F-type R and receives a 55-hp bump to match the coupe's 550 horsepower.

– **XE:** Jaguar serves up a juicy fillet in the luxury market's meat-and-potatoes segment with this smooth-riding, quick-cornering sports sedan. The XE's best attribute isn't the speed of the new infotainment system (slow) or the spaciousness of the back seat (meager), but how it drives, with perfect body control, high-fidelity steering, and responsive engines. Initially, power comes from either a 340-hp supercharged V-6 or a 180-hp diesel six-cylinder. The populist option, a turbocharged gas four-cylinder, won't be available until six months after the XE's launch next spring.



Jaguar XE ↗



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Kia Sorento



XF: Although it looks like a mere mid-cycle refresh, the 2016 XF is a ground-up redesign based on the same aluminum-intensive architecture that underpins the XE. While the wheelbase grows two inches compared with the outgoing model, the weight drops between 132 and 265 pounds depending on the trim, according to Jag. When it launches this fall, the XF will offer a supercharged 3.0-liter V-6 in either 340- or 380-hp tune, paired to an eight-speed automatic with rear- or four-wheel drive. We expect future four-cylinder, V-8, and diesel options.

Minor trim changes:

XJ

Dead: XK

Jeep

Grand Cherokee: The grandest of Jeeps gets a bit lighter and more efficient for 2016. All models see additional aluminum in their independent suspensions, while non-SRT versions are equipped with electric power steering and lower-rolling-resistance tires. The standard 290-hp Pentastar V-6 lives on and gains stop-start capability, as well as improved combustion via an exhaust-gas recirculation system, variable valve lift, and revised variable valve timing. Infotainment additions (touch-screen customization and Apple's Siri Eyes

Free integration, which pipes the virtual admin's voice through your car's speakers) round out the updates. Changes to the 475-hp Grand Cherokee SRT are limited to a revised instrument cluster and information display, plus a greater array of timers in the SRT Performance Pages menu.

Renegade: see [comparison test, page 086](#)

Minor trim changes:

Cherokee, Compass, Patriot, Wrangler

Kia

Optima: Trailing the replacement of its platform twin, the Hyundai Sonata, by a year, the all-new 2016 Optima goes on sale in November as a slightly larger mid-size sedan with three engine choices and sleeker and more-refined sheetmetal. The all-four-cylinder lineup includes a 2.4-liter base engine, a 2.0 turbo, and a mileage-oriented 1.6 turbo, the latter with a new seven-speed

dual-clutch automatic in place of the others' six-speed auto. Kia promises improved structural rigidity and driving dynamics as well as upped interior quality and comfort. There's a raft of optional luxury and safety gear, including pleated-leather trim, a 14-speaker stereo, and Android Auto or Apple CarPlay integration. For now, the Optima hybrid continues in the body of the previous model.

Rio/Rio 5-Door: A face lift for Kia's

commuter cub includes new front and rear fascias and upgraded interior materials.

Sorento: The reinterpretation of Kia's old SUV into a comfortable cruiser with reputable handling is complete with the '16, which appeared earlier this year. Optional luxury trappings abound, and the price, which ranges from around \$26,000 all the way to \$44,000, reflects it. Three engines are on this big crossover's menu: an overmatched 2.0-liter

Lamborghini Aventador SV



turbo four, a 2.4-liter four, and a 3.3-liter V-6.

— **Soul:** see comparison test, page 086

— **Minor trim changes:** Cadenza, Forte, Forte5, Forte Koup, K900, Optima hybrid, Sedona, Soul EV, Sportage

Lamborghini

— **Aventador SV:** How super is the Superveloce? To the regular Aventador, Lamborghini adds 49 horsepower, raises the redline by 150 rpm, and cuts 110 pounds, then finishes the package with carbon-ceramic brakes, magnetorheological dampers, variable-ratio steering, and an extra \$90K on the sticker. The resulting 740-hp carbon-fiber wedge screams to 8500 rpm and inhales the Nürburgring in less than seven minutes. Price: \$493,095.

— **Minor trim changes:** Aventador, Huracán

Land Rover

— **Discovery Sport:** This compact SUV arrived as a late 2015 model to replace the mediocre, ancient, and now dead LR2. It's handsome and roomy, with great outward visibility and a relatively low price. That's the good. The bad is that the single powertrain, a Ford-sourced 2.0-liter turbo four and a ZF nine-speed automatic, is tepid, with unpredictable power delivery and harsh shifts. Land Rover plans to install its own Ingenium four-cylinders in the Sport, which should fix the drivability issues; unfortunately, they won't arrive until after 2016. New standard stuff includes the ability to control some vehicle functions via a smartphone app.

— **Range Rover:** You can now—finally!—spend \$200,000 on a Range Rover in the form of the long-wheelbase, 550-hp

SVAutobiography. While the name is silly, the list of hedonistic delights is no joke: milled-aluminum trim, power-retractable rear tables, four-zone climate control, a 29-speaker audio system, plush mohair floor mats, a rear-seat beverage cooler, and oh so much more. It also has an optional power-sliding cargo floor that can be finished in various woods likely harvested from trees whose names we can't pronounce.

Those who must slum it in lesser models have a new 254-hp, 440-lb-ft turbo-diesel V-6 option to ponder. And the HSE's supercharged V-6 has 40 additional horsepower. Smartphone control of the climate control,

door locks, and remote start; improved camera resolution; and a hands-free, foot-wave liftgate function are new, too.

Range Rover Evoque:

The glam Evoque, which plays Fendi clutch to the Discovery Sport's Filson duffel (they share a platform), gets new seats, more soft-touch interior materials, updated front and rear graphics, and some safety tech to ensure you don't hit stuff when you're busy trying to operate the new InControl Touch infotainment setup. There's also a low-speed cruise control for off-road excursions. It will never be used by any Evoque owner, ever. Way more interesting is the Evoque convertible, which carries forward the grand tradition of absurd and strangely captivating droptops such as the AMC Eagle

Sundancer, Dodge Dakota convertible pickup, and the Nissan Murano CrossCabriolet. When it hits our shores next year, expect the same turbocharged 2.0-liter engine and nine-speed automatic as the normal Evoque as well as lots of confused stares.



Range Rover Sport:

After Land Rover added the ludicrous 550-hp SVR last year, with its 'Ring lap time of 8:14 and 33-inch wading depth, the rest of the lineup now comes in for updates. For starters, the Sport will also be available with the diesel V-6; it's expected to return 22 mpg city and 28 highway in both the Sport and the Range Rover proper. The rest



Land Rover Discovery Sport



Lexus GS F



of the tech updates mentioned elsewhere also appear here, too. Finally, the new HST Limited Edition packs a slightly updated supercharged V-6 (380 horsepower), sportier chassis tuning, two-tone leather upholstery, and some of the SVR's aesthetic bad-assitude.

Minor trim changes:

LR4

Dead: LR2

Lexus



ES: One of autodom's preeminent rolling sofas, the freshened ES now has a larger, brasher version of Lexus's Predator-esque maw. Lexus's new Safety System+ bundles adaptive cruise, auto high-beams, lane-departure warning, auto braking, pedestrian detection, and forward-collision alert, all at a sub-\$650 option price.

GS/GS F: Yes, it's still a very good car. And,

yes, it's time for a refresh. The 2016 update will bring Lexus's latest infotainment and safety technologies, rejiggered head- and taillamps, updated bumpers, and a reworked interior. The most important thing we expect to see, however, is a GS200t model packing the brand's new turbocharged engine. The four-cylinder makes 235 horsepower and 258 pound-feet of torque in its transverse application for the NX200t crossover, which would make it competitive with the turbo fours from Audi and BMW, although the ratings might rise for this larger, rear-drive sedan.

Lexus is for real about cultivating a sporty image, which means it needs more than one brawny, high-performance F car in its lineup. Enter the GS F, which rumbles forth in November. The car ain't got time for

forced induction, instead relying on a naturally aspirated, 467-hp V-8 and a svelte-for-the-class curb weight to battle the big guns from Stuttgart, Munich, and, um, SoHo. Zero to 60 should be in the 4.4-second range, and subtly aggro styling and comparatively docile handling will be its calling cards.

IS: Depending on how you spec it, this sports sedan can be the best car in its class (IS350 F Sport) or one of the worst (IS250 AWD). But, hark! There is hope in Lexus land, as the IS250 and its 204-hp V-6 soon will be mercy-killed and replaced with the turbocharged IS200t. (Both cars may be sold concurrently for a time.) The lack of power isn't the only problem with the IS250, though, and it remains to be seen if the new turbo car will

offer the chassis and transmission upgrades that make the range topper so satisfying to drive.

LX: The rock-crushing LX is geriatric enough to have undergone two updates since its last full redesign in 2007, and 2016 will bring a third. We expect the refresh largely to focus on technology, interior materials, and styling in an attempt to keep it relevant against newer stuff like the Audi Q7 and Cadillac Escalade.

RC: This sports coupe launched only as the RC350 for 2015, and was followed shortly thereafter by the fire-breathing RC F. We're thinking that now's the time for a less expensive turbo model. Lexus remains mum on such a car as of press time, but it has confirmed plans to shove the 2.0-liter turbo four into every hole it can find in order

to improve its fleet fuel economy.

RX: The RX is all-new and adopts the brand's bold new styling language. Will it repel the hordes who make this the bestselling Lexus nameplate by far? It's longer overall than before, with a two-inch-longer wheelbase, which means more stretch-out room in the second row. The 3.5-liter V-6 in RX350 models makes about 30 more horsepower, for a total of 300 or so, and there is once again a hybrid. All RXs have an eight-speed auto. Front-wheel drive is standard and four-wheel drive optional, while the F Sport trim, four-wheel drive only, offers aggressive visuals and a slightly sportier mode for the adjustable suspension.

Minor trim changes:

CT200h, GX460, LS460/460L/600hL, NX300h, RC350

Unchanged: NX200t, RC F

Dead: IS C



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Lincoln MKX



Lincoln

– **MKX:** This is a thorough redo of Lincoln's Ford Edge-based mid-size crossover. The exterior design is restrained, elegant, and borrows heavily from the smaller MKC. Inside, the cabin gets a push-button shifter, soft leather, and equally supple seats. A 19-speaker Revel-branded audio system will be optional. Two engines will be available: a standard 300-hp 3.7-liter V-6 and an optional twin-turbo 2.7-liter V-6 with an estimated 330 horsepower. Front-wheel drive is standard while four-wheel drive will be a \$2495 option. Pricing starts just under \$40,000 and can rise beyond \$55,000 for the top-spec Black Label trim. We are eager to hear what Matthew McConaughey thinks of it.

Minor trim changes: MKC

Unchanged: MKS, MKT, MKZ/hybrid, Navigator

Lotus

– **Evora 400:** When Lotus announced it was taking 2015 off, we feared that the British sports-car maker would soon depart the U.S. market and never return. Thankfully, we were wrong. The mid-engine, 2+2 Evora returns with restyled front and rear fascias, as well as some interior

tweaks to make the rear seat wider and the doorsills lower and narrower. Better yet, the supercharged 3.5-liter V-6, still sourced from Toyota, gets a 55-hp bump to an even 400. A claimed 49-pound reduction, which lowers the curb weight to just over 3100 pounds, carries on Lotus's long-standing tradition of adding lightness. The 400 goes on sale this fall and will cost about \$90,000, a few thousand more than a base Porsche 911.

Maserati

– **Ghibli:** A rear-drive S model with the four-wheel-drive S Q4's Ferrari-built, 404-hp twin-turbo V-6 arrives. The S features a sport exhaust, a limited-slip diff, Wi-Fi connectivity, an eight-speed automatic, and Maserati's Skyhook variable dampers. There are also new interior packages for all models, carrying the branding of Italian

fashion house Ermenegildo Zegna; they line the interior in anthracite-colored silk and a choice of red, natural, or black leather, and are constructed using several stitching techniques and styles, such as "ton-sur-ton" and "macro-chevron." Too fancy for our pay grade.

– **Levante:** A major weapon in the company's global-sales offensive, the Maserati of SUVs is expected to make its debut in January at the Detroit auto show. If our intel holds, it will offer twin-turbocharged V-6 and V-8 engines; the former likely will be available in 350- and 450-hp strengths, while the latter could push or even exceed 600 horses. An eight-speed ZF automatic should be the transmission for all versions. The styling

theme will be more high-riding, sleek wagon than butch off-roader—think lifted Ferrari FF with an extra pair of doors rather than Lamborghini LM002.

– **Quattroporte:** Did you read the Ghibli bit? It's almost exactly the same story here, including a new 404-hp rear-drive S model.

– **Unchanged:** GranTurismo, GranTurismo convertible

Mazda

– **CX-3:** see comparison test, page 086

– **MX-5 Miata:** Our favorite affordable roadster is new for 2016, and everything we've always loved about Miatas is present and accounted for. Bucking industry

trends, it's smaller than its predecessor and a whopping 231 pounds lighter on our scales. A version of the direct-injected 2.0-liter from the Mazda 3 makes 155 horsepower and 148 pound-feet of torque here, 12 less horsepower than the outgoing Miata but 8 more pound-feet. It's quicker anyway, and now rated at 27 mpg in the city and 34 on the highway. It remains less about numbers than feel, a car that invites the driver to explore its limits no matter the situation. The \$25,735 base price represents perhaps the best performance value in the industry.

– **6:** A redesigned dashboard and center stack give the feeling of a more spacious cockpit without changing any hard points, and improved sound insulation is said to cut interior noise by

McLaren 570S



as much as 25 percent. As on the CX-5, the headlights, grille, and taillights also get a nip and tuck.

Minor trim changes: CX-5, 3

Unchanged: CX-9

Dead: 2, 5

McLaren

570S: An entry-level McLaren, like an entry-level Ferrari, is an oxymoron. But the new 570S is the first model of a lineup called the Sports Series, featuring cars with sub-\$200,000 pricing that makes them competitors to the 911 Turbo S rather than the cars of Maranello. Nearly the same size as the 650S and resembling its more expensive brother, the 570 also evokes the million-dollar P1 with its funky taillights. In the interest of daily use, the two-seat 570S has a carbon-fiber tub that's easier to get in and out of thanks to narrower doorsills than any other McLaren. A 562-hp 3.8-liter V-8 that is closely related to the 641-hp engine in the 650S connects to a seven-speed dual-clutch automatic; McLaren claims a zero-to-62-mph time of 3.2 seconds.

675LT: A lighter and more powerful version of the 650S, it adds 25 horsepower for a total of 666 and features new bodywork with a larger front splitter, rear wing, and diffuser. Length grows by 1.5 inches. Lighter seats, plexiglass windows, and additional carbon-fiber bodywork shed a claimed 220 pounds from the 650S. Only 500 will be made, and they're said to be sold out despite a base price of nearly \$350,000.

Minor trim changes: 650S

Dead: P1



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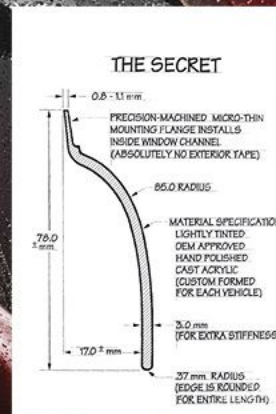
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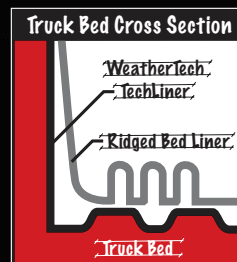
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TO KEEP THESE GUYS ON THE ROAD.

by Jared Gall

PHOTOGRAPHY BY MARC URBANO





MAZDA CX-3

JEEP RENEGADE

PRICE: \$26,360
POWER: 180 HP
TORQUE: 175 LB-FT
WEIGHT: 3395 LB
C/D OBSERVED MPG: 25

FIAT 500X

PRICE: \$29,100
POWER: 180 HP
TORQUE: 175 LB-FT
WEIGHT: 3361 LB
C/D OBSERVED MPG: 24

CHEVROLET TRAX

PRICE: \$25,540
POWER: 138 HP
TORQUE: 148 LB-FT
WEIGHT: 3256 LB
C/D OBSERVED MPG: 23

HONDA HR-V

PRICE: \$26,720
POWER: 141 HP
TORQUE: 127 LB-FT
WEIGHT: 3106 LB
C/D OBSERVED MPG: 26

KIA SOUL

PRICE: \$24,750
POWER: 164 HP
TORQUE: 151 LB-FT
WEIGHT: 3085 LB
C/D OBSERVED MPG: 25

MAZDA CX-3

PRICE: \$25,500
POWER: 146 HP
TORQUE: 146 LB-FT
WEIGHT: 2932 LB
C/D OBSERVED MPG: 28

In the beginning, God may have created the heavens and the Earth, but it was Cambrian metazoan hookup culture that gave us the basis of most life-forms we know today. In the 550 million or so years since the Cambrian explosion, science tells us, just about every organism that ever existed has gone extinct. The lucky minority adapted, survived, and—skipping way ahead to the good part—became you and me.

Automotive archeologists of the future will find in the fossil record of the early-21st-century evidence of a similar explosion of new life-forms, with the emerging tiny-ute class being one bewilderingly diverse phylum.

All six wee boxes here bear traces of subcompact-hatchback DNA. The segment leader, the Kia Soul, shares its underpinnings with the Kia Rio. Renewed in 2014, the Soul took first place in a previous comparison test [*“Flat-Pack Rats,”* February 2014] and is also the market’s favorite, with the American public annually snapping up more than 100,000 of these Korean parcels. Soul pricing starts just over \$16,000, while the Soul + tested here—with its 164-hp 2.0-liter four, panoramic sunroof, keyless entry and starting, and heated and ventilated front seats—rings in at \$24,750. It’s the only vehicle in this gathering that isn’t four-wheel drive, because Kia doesn’t offer it that way.

Like the Soul, the Jeep Renegade has the profile of a car drawn by a four-year-old—a short rectangle atop a longer one atop some circular wheels. All-new for 2015, the Renegade shares its platform with the Fiat 500X, right down to its 101.2-inch wheelbase. With the test’s most powerful engine—also shared with the Fiat—sending 180 horsepower through a nine-speed automatic transmission, our Renegade Latitude 4x4 stickers at \$26,360.

Still upright, but less of a cubist’s delight, is the Chevrolet Trax. Buick, of all brands, was one of the pioneers in the subcompact-crossover class. After sales of the Buick Encore surprised the suits, General Motors made the call to start shipping the more affordable Chevy—already available overseas—to the States. The \$15,000 Sonic lends its platform and its 1.4-liter turbocharged four. Our four-wheel-drive LT checks in at \$25,540.

The Fiat 500X, Honda HR-V, and Mazda CX-3 serve as the rectilinear subset’s foils. Their sculpted bodies suggest an athleticism that, if realized, ought to give them a leg up on the box-car set. From certain angles, the new-for-2016 Fiat 500X has the look of an embryonic Porsche Macan. The Easy trim level is just the second of five tiers, but this one is loaded with Beats audio, a panoramic sunroof, parking sensors, and a rearview camera. It rings in just shy of 30 grand, at \$29,100.

If there’s such a thing as provenance in the \$16,000-economy-car gene pool, the Honda HR-V has it. Based on the Fit, it boasts that seven-time 10Best’s outsized interior-space measurements and flexibility. The Fit itself was redone for 2015, its already colossal (for the class) interior benefiting from a 1.2-inch wheelbase stretch. The HR-V tugs the axles an additional 3.2 inches apart, so we’re expecting positively limousinelike stretch-out space. Fully loaded at \$26,720, the Honda verges on Korean value standards.

IT’S RARE THAT A CLASS OF VEHICLE JUST EXPLODES INTO BEING WITH SUCH WILDLY DIVERGENT LOOKS AND CHARACTERISTICS.



VEHICLE	2015 CHEVROLET TRAX LT AWD	FIAT 500X EASY AWD	HONDA HR-V EX-L AWD	2015 JEEP RENEGADE LATITUDE 4X4	2015 KIA SOUL +	MAZDA CX-3 TOURING AWD
BASE PRICE	\$24,820	\$25,100	\$26,720	\$24,290	\$19,515	\$24,090
PRICE AS TESTED	\$25,540	\$29,100	\$26,720	\$26,360	\$24,750	\$25,500
DIMENSIONS						
LENGTH	168.5 inches	167.2 inches	169.1 inches	166.6 inches	163.0 inches	168.3 inches
WIDTH	69.9 inches	70.7 inches	69.8 inches	74.3 inches	70.9 inches	69.6 inches
HEIGHT	65.9 inches	63.7 inches	63.2 inches	66.5 inches	63.0 inches	60.7 inches
WHEELBASE	100.6 inches	101.2 inches	102.8 inches	101.2 inches	101.2 inches	101.2 inches
FRONT TRACK	60.6 inches	60.7 inches	60.4 inches	60.6 inches	61.7 inches	60.0 inches
REAR TRACK	60.6 inches	60.7 inches	60.6 inches	60.6 inches	62.2 inches	59.9 inches
INTERIOR VOLUME	F: 51 cubic feet R: 42 cubic feet	F: 51 cubic feet R: 40 cubic feet	F: 51 cubic feet R: 47 cubic feet	F: 55 cubic feet R: 45 cubic feet	F: 50 cubic feet R: 47 cubic feet	F: 49 cubic feet R: 38 cubic feet
CARGO BEHIND	F: 48 cubic feet R: 19 cubic feet	F: 32 cubic feet R: 12 cubic feet	F: 56 cubic feet R: 23 cubic feet	F: 51 cubic feet R: 19 cubic feet	F: 50 cubic feet R: 19 cubic feet	F: 42 cubic feet R: 12 cubic feet
POWERTRAIN						
ENGINE	turbocharged DOHC 16-valve inline-4 83 cu in (1364 cc)	SOHC 16-valve inline-4 144 cu in (2360 cc)	SOHC 16-valve inline-4 110 cu in (1799 cc)	SOHC 16-valve inline-4 144 cu in (2360 cc)	DOHC 16-valve inline-4 122 cu in (1999 cc)	DOHC 16-valve Atkinson-capable inline-4 122 cu in (1998 cc)
POWER HP @ RPM	138 @ 4900	180 @ 6400	141 @ 6500	180 @ 6400	164 @ 6200	146 @ 6000
TORQUE LB-FT @ RPM	148 @ 1850	175 @ 3900	127 @ 4300	175 @ 3900	151 @ 4000	146 @ 2800
REDLINE/FUEL CUTOFF	6500/6500 rpm	6500/6500 rpm	6750/6750 rpm	6750/6500 rpm	6800/6500 rpm	6800/6800 rpm
LB PER HP	23.6	18.7	22.0	18.9	18.8	20.1
DRIVELINE	6-speed automatic	9-speed automatic	CVT all	9-speed automatic	6-speed automatic	6-speed automatic
TRANSMISSION	all	all	all	all	front	all
DRIVEN WHEELS	all	all	Low: 2.53/5.5/37 High: 0.41/34.0/117	all	all	all
GEAR RATIO:1/MPH PER 1000 RPM/ MAX MPH	1 4.58/4.9/32 2 2.96/7.5/49 3 1.91/11.7/76 4 1.45/15.4/100 5 1.00/22.3/115 6 0.75/29.8/110	1 4.71/4.3/28 2 2.84/7.1/46 3 1.91/10.6/69 4 1.38/14.7/96 5 1.00/20.3/120 6 0.81/25.0/115 7 0.70/29.0/105 8 0.58/35.0/92 9 0.48/42.3/85	1 4.71/4.5/29 2 2.84/7.5/49 3 1.91/11.4/74 4 1.38/15.5/101 5 1.00/21.7/114 6 0.81/26.6/109 7 0.70/30.0/99 8 0.58/37.4/86 9 0.48/44.0/79	1 4.40/5.3/34 2 2.73/8.5/55 3 1.83/12.7/83 4 1.39/16.7/109 5 1.00/23.2/116 6 0.78/29.8/110	1 3.55/4.9/33 2 2.02/8.6/58 3 1.45/12.0/82 4 1.00/17.4/118 5 0.71/24.5/120 6 0.60/29.0/115	1 3.55/4.9/33 2 2.02/8.6/58 3 1.45/12.0/82 4 1.00/17.4/118 5 0.71/24.5/120 6 0.60/29.0/115
AXLE RATIO:1	3.53	3.73	5.44	3.73	3.27	4.33
CHASSIS						
SUSPENSION	F: struts, coil springs, anti-roll bar R: torsion beam, coil springs	F: struts, coil springs, anti-roll bar R: struts, coil springs, anti-roll bar	F: struts, coil springs, anti-roll bar R: torsion beam, coil springs, anti-roll bar	F: struts, coil springs, anti-roll bar R: struts, coil springs, anti-roll bar	F: struts, coil springs, anti-roll bar R: torsion beam, coil springs	F: struts, coil springs, anti-roll bar R: torsion beam, coil springs
BRAKES	F: 11.8-inch vented disc R: 10.6-inch disc	F: 12.0-inch vented disc R: 11.0-inch disc	F: 11.5-inch vented disc R: 11.1-inch disc	F: 12.0-inch vented disc R: 11.0-inch disc	F: 11.0-inch vented disc R: 10.3-inch disc	F: 11.0-inch vented disc R: 11.1-inch disc
STABILITY CONTROL	partially defeatable, traction off	partially defeatable	partially defeatable	partially defeatable, traction off	partially defeatable	traction off
TIRES	Continental ContiProContact P205/70R-16 96H M+S	Nexen Classe Premiere CP671 215/60R-17 96T M+S	Michelin Primacy MXV4 215/55R-17 94V M+S	Kumho Crugen Premium 225/55R-18 98H M+S	Kumho Solus TA31 215/55R-17 94V M+S	Yokohama Avid S34 P215/60R-16 94H M+S
C/D TEST RESULTS						
ACCELERATION						
0-30 MPH	3.2 sec	3.0 sec	3.7 sec	3.1 sec	2.9 sec	2.8 sec
0-60 MPH	9.8 sec	8.7 sec	9.3 sec	9.1 sec	8.5 sec	8.1 sec
0-100 MPH	36.6 sec	28.0 sec	29.1 sec	32.9 sec	26.5 sec	23.8 sec
0-110 MPH	-	40.3 sec	45.6 sec	-	-	32.5 sec
1/4-MILE @ MPH	17.5 sec @ 79	16.8 sec @ 82	17.4 sec @ 82	17.0 sec @ 81	16.7 sec @ 84	16.3 sec @ 86
ROLLING START,						
5-60 MPH	10.3 sec	9.0 sec	9.8 sec	9.9 sec	8.6 sec	8.3 sec
TOP GEAR, 30-50 MPH	5.1 sec	4.6 sec	4.8 sec	4.8 sec	4.0 sec	3.9 sec
TOP GEAR, 50-70 MPH	7.0 sec	6.1 sec	6.7 sec	6.6 sec	6.1 sec	5.7 sec
TOP SPEED	115 mph (drag ltd)	120 mph (gov ltd)	117 mph (drag ltd)	114 mph (drag ltd)	116 mph (drag ltd)	120 mph (drag ltd)
CHASSIS						
BRAKING, 70-0 MPH	169 feet	163 feet	170 feet	181 feet	167 feet	181 feet
ROADHOLDING, 300-FT-DIA SKIDPAD						
610-FT SLALOM	0.72 g* 38.5 mph*	0.78 g* 39.6 mph*	0.84 g* 39.7 mph*	0.74 g* 38.5 mph*	0.78 g* 38.9 mph*	0.81 g* 42.1 mph*
WEIGHT						
CURB	3256 pounds	3361 pounds	3106 pounds	3395 pounds	3085 pounds	2932 pounds
%FRONT/%REAR	60.7/39.3	60.3/39.7	59.8/40.2	59.9/40.1	60.9/39.1	59.8/40.2
CG HEIGHT	24.5 inches	25.0 inches	25.0 inches	26.0 inches	25.0 inches	22.5 inches
FUEL						
TANK	14.0 gallons	12.7 gallons	13.2 gallons	12.7 gallons	14.2 gallons	11.9 gallons
RATING	87 octane	87 octane	87 octane	87 octane	87 octane	87 octane
EPA CITY/HWY	24/31 mpg	21/30 mpg	27/32 mpg	21/29 mpg	23/31 mpg	27/32 mpg
C/D 300-MILE TRIP	23 mpg	24 mpg	26 mpg	25 mpg	25 mpg	28 mpg
PRACTICAL STOWAGE						
NO. OF 9 X 11 X 16-IN BOXES,						
SEATS UP/FOLDED	10/31	6/24	14/37	12/37	7/31	7/22
LENGTH OF PIPE	115.3 inches	110.3 inches	115.8 inches	119.5 inches	118.8 inches	112.0 inches
LARGEST FLAT PANEL,						
LENGTH X WIDTH	57.5 x 39.5 inches	59.5 x 37.8 inches	64.0 x 39.5 inches	60.5 x 37.5 inches	57.5 x 41.5 inches	56.5 x 39.0 inches
SOUND LEVEL						
IDLE	42 dBA	41 dBA	41 dBA	40 dBA	36 dBA	39 dBA
FULL THROTTLE	78 dBA	73 dBA	77 dBA	74 dBA	77 dBA	78 dBA
70-MPH CRUISE	71 dBA	69 dBA	71 dBA	70 dBA	69 dBA	71 dBA

*Stability-control inhibited.

Or maybe the Mazda CX-3 has the chromosomal hot ticket. It traces its roots to the Mazda 2, a cannonball of underpowered fun that, as of the 2016 model year, is no longer sold in the U.S. So if you want one, this is the form it now takes—and what a lovely form it is. With its long hood stretching in front of a cab-rearward greenhouse, the CX-3 certainly looks the sportiest. Pricing starts at just over \$20,000, but this moderately optioned, four-wheel-drive Touring model rings up at \$25,500.

We don't have a Nissan Juke here because that early (and weird) subcompact-crossover experiment already lost a comparison test to the Mini Countryman. And we don't have a Countryman here because Mini was unable to provide a competitively priced example. Even without them, our roster is already teeming with life.

6. CHEVROLET TRAX

It's been years since we gathered a group of vehicles wherein the quickest car needed more than eight seconds to hit 60 mph. In the Trax, the slowest of our competitors, zero to 60 isn't so much a sprint as it is a 10-year goal. We can't remember the last

CHEVROLET TRAX



ROOMY, MORE COMPOSED THAN ITS TEETERING PROPORTIONS SUGGEST.



CHEAP INTERIOR, TERMINALLY DULL EXTERIOR.



A SOLID EFFORT IN A VACUUM WITHERS WHEN FACED WITH ITS COMPETITION.

time we pulled behind a city bus stopped at a red light instead of taking the adjacent open lane because we didn't think we'd beat said bus off the line. Given the dearth of power, it's particularly surprising that the six-speed automatic zings convincing downshifts in manual mode. But the driver calls for those shifts using a toggle switch on the side of the shifter, which is about as engaging as literally calling for shifts by hollering at the car. "Downshift! Upshift! [Wait for rpm to climb.] Up . . . [wait a little longer] shift!" Guess we'll just leave it in automatic mode.

While the Chevrolet's 51 cubic feet of front-passenger space and 42 in the back are impressive, so capacious is its class that those figures don't stand out in this test. But the Chevrolet's upright seating position and low beltline grant the driver excellent sightlines, and there's so much headroom that even our tallest tester noted that he could drive the Trax with an apple on his head. Also, the

THE TRAX EXPRESSES TRAITS LONG ASSOCIATED WITH THE GENUS *RENTAL-CARUS*: EXCESSIVELY LOUD VOCALIZATIONS, EXTREME LETHARGY, CONTAGIOUS MELANCHOLIA, AND A DULL COAT. IF IT WEREN'T FOR ALL ITS COMPETITORS, THE TRAX WOULD BE THE FITTEST FOR SURVIVAL.





Trax topped our back-seat-comfort rankings with two people aboard, although when we added a third, the middle passenger had to lean his shoulders forward in order to clear the outboard riders.

Spacious as it is, the Trax's cabin is rendered in materials that lag markedly behind the others tested. Flashing on the interior panels betrays where their molds parted, and while the circular dash vents look cool, in operation they feel like they're grinding through a layer of kitty litter. The Trax rides comfortably enough and handles more competently than its skyscraper proportions suggest, but as we drove each of its competitors it slid further down our list. Its rental-fleet shape sets low expectations that it has no problem fulfilling. But its competitors are better.

5. HONDA HR-V

The HR-V is based on the most decorated nameplate of any car here (the Fit), has the largest cargo hold and back seat, offers a competitively sized front seat, and is tied with the Kia and Mazda for nicest interior fit and finish. Not only does it have a spacious back bench, but the gentle upward slope of the floorpan beneath the front seats (to accommodate the under-floor fuel tank) means that back-seat riders can rest their sneakers on what resembles a six-figure luxury sedan's rear footrests.

▲ BASED ON THE SAME PLATFORM AS OUR ONE-TIME FAVORITE ECONOMY CAR, THE FIT, THE HR-V INHERITS NONE OF THAT VEHICLE'S VERVE. IT'S JUST A CUSHY LITTLE MUSHBALL WITH VIDEO-GAME STEERING AND A DRONE-INDUCING CVT. IT DOES, HOWEVER, HAVE THE LARGEST CARGO HOLD IN THE TINY-UTE CLASS.

HONDA HR-V

➕ COHESIVE AND UPSCALE INTERIOR DESIGN, COMFORTABLE HIGHWAY RIDE.

➖ JUST SAY NO TO CVTS, FLAGRANTLY COMPROMISES THE FIT'S STRENGTHS.

⚠️ GREAT MOUNDS OF UNREALIZED POTENTIAL CRAMMED INTO SUCH A SMALL BODY.

But the HR-V's driving experience leaves much to be desired. Its 141 horsepower is three more than the weakest-in-test Trax, but the Honda's 127 pound-feet gives up 21 to the Chevy and peaks nearly 2500 rpm later. The HR-V's mooing CVT emphasizes just how hard the 1.8-liter works even while making little speed. Roll into the throttle when already underway, and you have to toe in deeply before the transmission starts to unwind rpm, which come on at such a leisurely pace that it ought to be wearing a Hawaiian shirt. Around town, the CVT lugs the engine at 1000 rpm, a speed that gently vibrates the entire car. There are paddle shifters, but the transmission does a disingenuous impression of a manual, with slow, drawn-out shifts. And while the compliant suspension grants the HR-V a comfortable highway ride, there's nothing about the chassis or the steering that tells the driver much about what's happening under the car.

Much of its packaging disappoints, too. The sweptback windshield seems aimed at the driver's forehead, forcing taller ones to adopt a similarly raked driving position. Combine that with a bot-

tom seat cushion that angles forward and driving the Honda feels like doing the limbo. Despite its best-in-test rear-seat volume, the HR-V's aggressive roofline cuts into headroom. Compared with the Honda Fit, which leads the industry for clown-car capacity, the HR-V is a blatant compromise. We found no storage bin or cubbyhole even big enough to stash our standard-issue reporter's notebooks.

That's what bothers us most about the HR-V: It's entering into a competitive new space, but ignoring the fierce competition in its own showroom. It's slower than the Fit and its fuel economy isn't as good, but in exchange, you get less useful space. Might as well just get a Fit.

4. FIAT 500X

Fiat is the perfect foreign partner for Mopar. The company that used to add cartoon-character decals to cars painted Top Banana and Sassy Grass, and named a special-edition pickup the Warlock, makes a fitting match for the company that produced the original, highly cheeky Cinquecento. And in this class of outsized personalities, the fraternal twins of Fiat Chrysler Automobiles (FCA) are something special.

FIAT 500X

+
FIAT CAN EVEN BUILD A MEASURE OF PLAYFULNESS INTO A TINY SUV.

-
A CONVINCING CASE FOR ITALIAN BUILD QUALITY'S PARITY WITH THAT OF THE CHINESE.

E
COULDN'T BE MORE OF A STEREOTYPE IF IT WERE CALLED THE GUIDO CORLEONE.

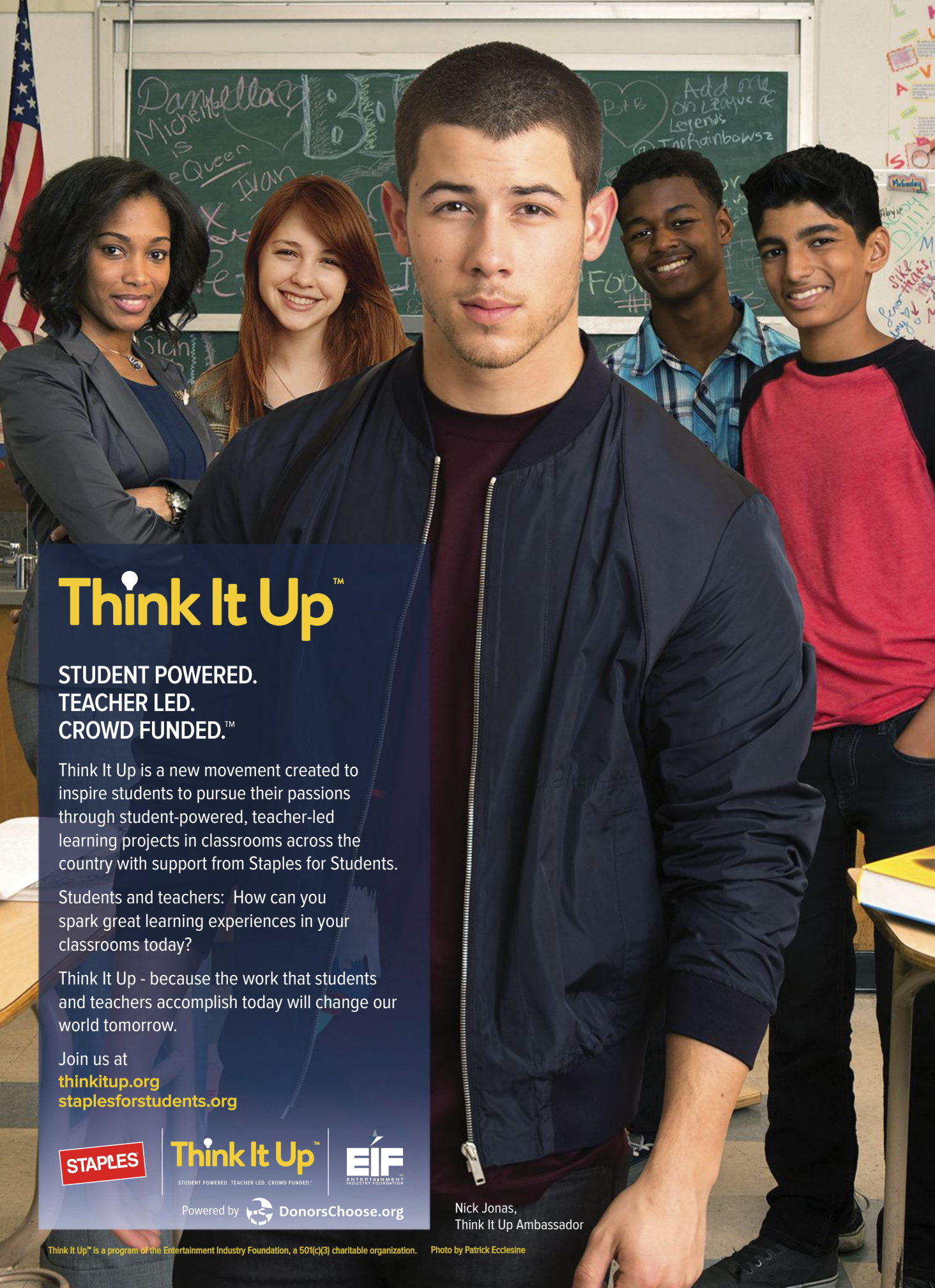
Both the Fiat 500X and the Jeep Renegade highlight this class's car-based roots with sure-footed, near-neutral handling; firm brake pedals; and steering wheels that at least hint to the driver at what's going on down below. And the Tigershark 2.4-liter that the two share boasts the test's highest output, along with a rumble gruff enough to match its bombastic name.

And yet the two mudskippers' performances varied. The Fiat's Nexen-brand Korean rubber outlasted the Jeep's Kumhos on the skidpad by a little and outstopped them by a lot. While the Jeep has a tippy feel thanks to a center of gravity proportional to its loftiest-in-test roofline, the comparatively taut Italian suffers its own kind of imperfect body control with paradigm-shifting head toss. We felt like sailors in a squall. Crest a hump wrong and you are battered senseless against the foremast—er, B-pillar.

Or maybe your head will just splinter the fore-

IN PROFILE, THE FIAT 500X LOOKS LIKE A KNOCK-OFF PORSCHE MACAN, WHICH IS TO SAY IT DOESN'T LOOK MUCH LIKE AN SUV. IF YOU WANT YOUR 500X TO LOOK MORE OFF-ROADY, YOU'LL HAVE TO SPRING FOR THE "TREKKING" MODEL, WHICH HAS MORE SILVERY PLASTIC ON THE NOSE.





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Photo by Patrick Ecclesine

mast. The 500X will change nobody's perception of Italian build quality. Many of the plastic interior surfaces are hard and hollow, and while the gray door-panel pleather feels natural, it's not the natural leather that it feels like. More like cold, dead skin before it's turned into leather—and not necessarily cow skin. Maybe dolphin. Or fat Uncle Carl. It puts the lotion squarely in the basket.

The infotainment screen and, more important, the central instrument-panel display wash out completely in direct sunlight. And with the Fiat's massive two-row sunroof, you get a lot of sunlight.

That \$1700 option not only helped bloat the sticker price of this example to more than what you'd pay for a very nice one-size-up Honda CR-V, it also further cut into headroom that's already hurting from the Fiat's stylishly swept roofline. Bolt-upright seatbacks already thrust rear-seat passengers' heads into the ceiling; with the sunroof, it becomes a kids-only affair in the back. Chrysler has a charming history of not taking itself too seriously. But if Fiat doesn't ratchet up its quality in a hurry, it will find that customers don't take it seriously, either.

JEEP RENEGADE

+
SPACIOUS DESIGNER INTERIOR, STARTLINGLY COMPETENT HANDLING.

-
HEAVY, NINE-SPEED LEAVES MANY KINKS TO BE WORKED OUT.

=
IT TURNS OUT THAT JEEP CAN EXCEL AT THINGS OTHER THAN BEING DIRTY.

YES, THE RENEGADE IS PRETTY MUCH JUST A CAR ENGAGING IN ELABORATE COSPLAY, BUT WE ARE CHARMED BY THE LITTLE BUGGER ANYWAY. THE CUBIC DESIGN ALLOWS FOR EXCELLENT CARGO AND PASSENGER SPACE. ITS CHASSIS IS MUCH MORE COMPETENT THAN WE EXPECTED IT TO BE.

3. JEEP RENEGADE

Jeeps tend to do well in our comparison testing—unless they're car-based Jeeps. Then, they tend to be in last place. But the Renegade has a back-road willingness absent not only in other Jeep products, but also in most vehicles not wearing overt sport branding. Its steering is nicely weighted and quick, and there's a hint of hot hatch in the succinct damper strokes.

The Jeep's seats were our favorite on the highway, though they lack the high-g support of the Mazda's. Among the many Easter eggs incorporated in the Renegade's design, the most appropriate one is the half-inch Sasquatch silhouette striding across the rear-window tint, just above the wiper. We like to think he's strolling back to his Renegade, the only one of its class with room for the missus and a pair of Squatchlets. The Jeep's 55 cubic feet of passenger space up front and 45 out back are more than you'd find in a Mercedes-Benz E-class. While our Jeep's





KIA'S BEEN AT THIS GAME THE LONGEST, AND IT SHOWS. THERE'S LITTLE TO GRIPE ABOUT IN THIS ATTRACTIVELY DESIGNED, REASONABLY PRICED, AND WELL-EQUIPPED BOX. FOR SNOW COUNTRY, A SET OF WINTER TIRES WILL MORE THAN COMPENSATE FOR THE SOUL'S LACK OF FOUR-WHEEL DRIVE.

brown, gray, and orange interior would look out of place in a Benz, it's also conspicuously rich for this price-conscious segment. And the Jeep's styling is ambitiously adventurous, despite it enshrouding the vehicle with the fewest extras.

An engine that actually pulls all the way to red-line, and sounds good doing it, lends an upscale feel. The 2.4's burly vocals never fray, again putting us in the new position of ranking anything about a car-based Jeep among the best in its class. Too bad we can't say the same about the transmission. Something tells us ZF intended this unit for applications with more than 175 pound-feet of torque, especially if those things weigh nearly 3400 pounds. Leave it in auto and it always seems to be in the wrong gear. As in other applications of the ZF nine-speed, shifts are alternately harsh and slurred. The trans hunts around between eighth and ninth a lot on the highway, and needs to get down to at least seventh to maintain speed on even slight grades. It also responds lethargically to manual commands and won't accept multiple manual downshifts. So if you start in ninth and want to get down to an appropriate gear for passing on a two-

KIA SOUL

+
FEELS GOOD
ENOUGH TO DITCH
THE VALUE-PLAY
APPROACH,
BUT DOESN'T.

-
WON'T TRIP ON ITS
OWN FEET, BUT
WON'T SWEEP YOU
OFF YOURS, EITHER.

=
UNFLINCHING
COMPETENCE WILL
TAKE YOU FAR—
BUT NOT ALL
THE WAY TO THE
TOP THIS TIME.

lane, start slapping the stick a good quarter-mile before that passing zone. Too bad the manual transmission isn't available with the 2.4-liter because it, too, is a carlike kind of good.

2. KIA SOUL

No other vehicle in this comparison existed prior to 2015; the Soul arrived for the 2010 model year. That's given it plenty of time to develop while the rest are still settling major evolutionary issues such as gills versus lungs. The Kia ethos: Throw in a lot of extras at a low price. As the cheapest in the test, the Soul packs in more extras than anything else here, except the nearly \$30,000 Fiat. Cooled seats alone should be worth 10 points in our final scoring if the vehicle is the only one to have them. It also has a huge, two-row sunroof as well as heated rear seats, outside mirrors, and steering wheel.

Whereas Kia used to package all its extra content in cheap, flimsy plastics, there's hardly an off note anywhere in the 2015 Soul's roomy cabin. From the soft-touch dash to the simple, easy-to-read gauges to the satin-silver-trim rings on the plentiful circular elements in the interior, it's all obsessively designed and rendered in high-quality materials.

The Soul is no apex predator, but neither is it a possum, pooping itself and slipping into a coma when threatened. Its mantra seems to be "cush

without slop, confidence without verve.” The steering is nicely weighted, but there’s not a lot of effort buildup or feedback through the wheel. It’s happiest gliding down the highway, not scorching down a remote two-lane (more likely in search of a restroom than fun). It goes where you want and mostly does what you ask, but there’s an isolation between driver and road that doesn’t egg you on.

Kia’s 2.0-liter is quiet at idle and willing enough under full throttle, though it, too, makes it clear that you’re not in a Volkswagen GTI. The transmission takes its time with shifts, but with just six ratios, it’s never far from the right one. Even though the Kia trails the FCA twins in output, it’ll beat both in a drag race. Confidence without verve indeed.

Eye-catching design in and out sets high expectations, and the rest of the car performs well enough not to dissuade you from your opinion. Rarely are we so smitten with a vehicle that makes so little effort to engage the driver, but rarely do we

WE KNOW HANDLING PROWESS IS NOT TOP-OF-MIND FOR MOST MINI-SUV BUYERS. BUT IF WE HAVE THE CHOICE BETWEEN A MINI SUV THAT IS FUN TO DRIVE AND ONE THAT IS NOT, WE WILL CHOOSE FUN EVERY TIME. CERTAINLY WHEN THAT’S COMBINED WITH BEST-IN-TEST ACCELERATION AND FUEL ECONOMY.

MAZDA CX-3

+
CARLIKE STANCE,
CARLIKE
DRIVING POSITION,
CARLIKE
BEHAVIOR.

-
FOUR-WHEEL
DRIVE IS THE ONLY
REASON NOT
TO JUST GET A
(ROOMIER)
MAZDA 3.

=
MAZDA COULD
PROBABLY BUILD A
SEMI TRACTOR
THAT’S FUN TO
DRIVE.

encounter such a fully realized, personable, and funky commuter.

1. MAZDA CX-3

From its wagonlike appearance to its seating position to the overall driving experience, the CX-3 is an awful lot like the 10Best-winning Mazda 3. It’s 7.3 inches shorter and 1.1 inches narrower, but 3.4 inches taller. The black-plastic cladding around the wheel wells and along the rockers butches it up a little, but this vehicle is easily the weakest nod to the whole crossover/SUV pantomime. This is a tall car, period. Limited ground clearance means that its four-wheel drive is strictly an inclement-weather system, but the same goes for the rest of the group. A heavy, soaking rain just days prior made our deep-woods photo shoot plenty tense. While no car got stuck, none is equipped with tires optimized for anything more extreme than commuting in light snow.

Mazda’s suspension tuning is spot on. Body roll is minimal and rebound is firm and controlled, but the ride is taut without being abusive. Lightest by 153 pounds, the CX-3 undercuts the test’s heavy-





weight, the Renegade, by nearly a quarter-ton. With power and torque both in the bottom half of the scorecard, the Mazda nonetheless was the quickest and fastest. Not surprisingly, it also recorded the best observed fuel economy. The engine makes a pleasant mid-range oogle, but by the time it hits redline, it's clear that this is a commuter engine, not a sports-car mill. But Mazda's transmission throws a bone to enthusiast drivers, with a crisp manual actuation that calls up immediate shifts.

Having less weight to manage no doubt helped produce the test's highest slalom speed. But with its tragically small 16-inch tires, not only does the Mazda look a bit awkward, it needed 181 feet to stop from 70 mph, tying the Jeep for worst. Upgrading to the sportier 18-inchers might improve that number and would certainly help the look.

To larger drivers, though, the Mazda can feel like a seven-eighths-scale car, with a narrow driver's seat that presses broader shoulders up against the B-pillar and puts knees tight into the door panel and center console. In the back seat, with his knees buried in the front seatbacks and head pressed hard into the headliner, technical editor Eric Tingwall, at 6 feet 2 inches, looked like a casting waiting to be popped from a mold.

If you fit, the CX-3 is a lovely place to be. Mazda's combination of interior design and materials is unbeatable. Our example's two-tone black-and-charcoal seats were trimmed with red piping, echoing red accents on the door panels and in the air vents. Those spherical vents have a zero-g feel, as though they're suspended in outer space.

It's this insistence on perfection in all things big and small that gives the CX-3 the win; its maker's sixth straight comparison-test victory. We're witnessing the birth of a new dominant species all right—not necessarily the subcompact crossover, but Mazda. ■

★ FINAL RESULTS

RANK	1	2	3	4	5	6
	Mazda CX-3	Jeep Renegade	Fiat 500X	Honda HR-V	Chevrolet Trax	
	Maximum points available	Touring	Latitude	Easy	EX-L	LT
VEHICLE						
DRIVER COMFORT	10	8	8	9	7	8
ERGONOMICS	10	9	9	8	7	6
REAR-SEAT COMFORT	5	2	4	4	2	4
REAR-SEAT SPACE*	5	2	5	4	3	5
CARGO SPACE*	5	3	4	4	1	5
FEATURES/AMENITIES*	10	6	9	5	10	7
FIT AND FINISH	10	8	8	7	6	8
INTERIOR STYLING	10	9	8	9	7	7
EXTERIOR STYLING	10	8	8	9	7	5
REBATES/EXTRAS*	5	0	1	0	0	0
AS-TESTED PRICE*	20	19	20	19	16	18
SUBTOTAL	100	74	84	78	66	61
POWERTRAIN						
1/4-MILE ACCELERATION*	20	20	18	17	18	15
FLEXIBILITY*	5	5	5	3	4	4
FUEL ECONOMY*	10	10	7	7	6	8
ENGINE NVH	10	7	7	8	8	6
TRANSMISSION	10	9	8	7	7	4
SUBTOTAL	55	51	45	42	43	35
CHASSIS						
PERFORMANCE*	20	18	17	15	18	19
STEERING FEEL	10	9	6	6	6	5
BRAKE FEEL	10	9	7	7	7	6
HANDLING	10	10	6	7	7	5
RIDE	10	8	8	8	7	8
SUBTOTAL	60	54	44	43	45	38
EXPERIENCE						
FUN TO DRIVE	25	22	15	16	14	11
GRAND TOTAL	240	201	188	179	168	143

Shell
V-POWER
NITRO+
Premium Gasoline
The Official Fuel of
CAR AND DRIVER

* These objective scores are calculated from the vehicle's dimensions, capacities, rebates and extras, and/or test results.

Mercedes-Benz

C-class: The old coupe carries on for one more year before being updated to the new chassis for 2017. The sedan, introduced last year, sees three new variants in 2016: a plug-in hybrid for ZEV states based on a turbocharged 2.0-liter four augmented with an 80-hp electric motor and a 6.2-kWh battery; a four-cylinder diesel C300d; and a C450 AMG that replaces the C400. This last one is the first in the new AMG "tween range, which sits below "full" AMG cars but above regular Mercs. With standard four-wheel drive and a 362-hp, twin-turbo 3.0-liter V-6, consider it a C63 (469 horsepower) with training wheels.

CLS-class: Four-wheel-drive models now use the same nine-speed automatic as rear-drivers. Stop asking about the shooting brake; it's not coming to the U.S.

G-class: The world's only factory-restomod

SUV gets an even more ridiculously over-the-top powertrain. For the first time, the Mercedes-AMG offers Americans a V-12 under the hood of this 36-year-old truck, in the guise of the 621-hp G65.



GLC-class: The old GLK's new name, GLC, reflects a nomenclature change that aligns Merc's SUVs with its traditional sedans, in this case the compact C-class. The GLC300 rides on a longer wheelbase than the GLK and boasts larger dimensions. The same turbo four from the C-class delivers 241 horses and 273 pound-feet, routed through a nine-speed automatic, with four-wheel drive optional.

GLE-class: The former M-class gets refreshed, renamed (GL... E-class, get it?), and coupe-ified [see GLE Coupe, right]. Engines mostly carry over from last year, though the four-cylinder diesel

is now known as the 300d. The Mercedes-AMG GLE63 gets a power bump from 518 to 550 horsepower while a new S version offers 577. A plug-in hybrid similar to the one in the S-class [see below] is heading to ZEV states.

GT: Its official name is "Mercedes-AMG GT," reflecting the corporate campaign that has all the true AMG cars labeled with the awkward hyphenate that seems to shortchange poor Karl Benz. Nevertheless, this twin-turbo, 4.0-liter V-8-powered sports coupe impresses. Mercedes launched the range-topping, 503-hp GT S model first this April. The base GT, with a mere 456 horses, will arrive next year.

S-class: The opulent Mercedes-Maybach S600 (again, sorry, Karl) went on sale in April, but despite its fancy name, deep shag carpet, and throw pillows, its V-12-powered siblings—the S65 AMG coupe and sedan—still rank as the most expensive Mercedes

PEER

INSPIRED BY THE

MARKETERS IN MUNICH,

THE MERCEDES-BENZ GLE

COUPE DOES A PASSABLE

IMPRESSION OF BMW'S X6.

by Jeff Sabatini

Sometimes a cigar is just a cigar. Or as Wolf-Dieter Kurz, the Mercedes-Benz vice president who introduced us to the new GLE Coupe puts it, "We are matching ourselves with those who have previously defined sportiness in this segment." That would be, quite obviously, BMW with its X6. The GLE Coupe is merely Stuttgart's version, no analysis needed.

A body variant of the mid-size, five-passenger M-class, now renamed "GLE" in Mercedes' nomenclature adjustment, the Coupe shares its interior, wheelbase, running gear, and certain powertrain configurations with its more conventional sibling. What it sacrifices in the rear is both significant—15 cubic feet of cargo space and a full slice of backseat headroom—and insignificant. Mercedes doesn't expect the GLE Coupe buyer to make more than the occasional use of the rear seats, which can still accommodate two average-sized adults, and there's ample room for luggage in the 23-cubic-foot cargo hold.

The regular, square GLE has been refreshed for 2016, yet developing the Coupe seems to have sucked up most of the budget. Even with the updating, all GLE interiors could use a little more brightwork, and they

Mercedes-Benz S65 AMG coupe



PRESSURE

GLE COUPES IN TWO
GUISES: AMG-LIGHT
(RED 450 AMG IN
BACK) AND FULL
STRENGTH (SILVER
AMG 63 IN FRONT).



SPECIFICATIONS

VEHICLE TYPE
FRONT-ENGINE, 4-WHEEL-
DRIVE, 5-PASSENGER,
4-DOOR HATCHBACK
BASE PRICE (EST)
\$70,500–\$110,000

ENGINES
TWIN-TURBOCHARGED
AND INTERCOOLED DOHC
24-VALVE 3.0-LITER V-6,
362 HP, 384 LB-FT; TWIN-
TURBOCHARGED AND
INTERCOOLED DOHC
32-VALVE 5.5-LITER V-8, 577
HP, 561 LB-FT

TRANSMISSIONS
7-SPEED AUTOMATIC WITH
MANUAL SHIFTING MODE,
9-SPEED AUTOMATIC WITH
MANUAL SHIFTING MODE

DIMENSIONS
WHEELBASE: 114.8 IN
LENGTH: 192.6–193.6 IN
WIDTH: 78.9 IN
HEIGHT: 67.6–67.7 IN
CARGO VOLUME: 23 CU FT

CURB WEIGHT
4900–5200 LB
PERFORMANCE (C/D EST)

ZERO TO 60 MPH
4.0–5.2 SEC
ZERO TO 100 MPH
9.6–12.1 SEC

1/4-MILE: 12.3–13.7 SEC
TOP SPEED: 155 MPH
FUEL ECONOMY (C/D EST)
EPA CITY/HWY
13–19/18–24 MPG

remain a half-notch below the year-old C-class in sumptuousness. And how is it that the “sporty” Coupe gets gray, pebbled-plastic body cladding while the boxy workhorse model has none?

Despite building the GLE Coupe exclusively in its Alabama plant, Mercedes will be selling only two versions of it here. Both wear AMG badges and have unmercifully long names. The “real” AMG model is the Mercedes-AMG GLE63 S 4MATIC Coupe, which uses the 5.5-liter twin-turbo V-8 from the E63 S sedan, making the same 577 horsepower but a bit less torque at 561 pound-feet. This overabundance of output is routed through an AMG-tuned seven-speed automatic and a four-wheel-drive system with a 40/60, front/rear, torque split.

There’s nothing subtle about this two-and-a-half-ton warhead, from its 22-inch wheels to the snarling exhaust rattle accompanying gearshifts. Nor is there much surprise; it’s exactly what you’d expect of an AMG-badged competitor to BMW’s X6 M. Just move the performance dial a quarter-turn from BMW sport to Benz luxury and enjoy.

Speaking of turning knobs, a new Dynamic Select system allows drivers to choose one of four

drive modes (comfort, sport, sport-plus, or slip-perry) via a center-console-mounted dial. Or you can change individual settings for the air suspension, transmission, and powertrain through the COMAND infotainment interface. Perhaps someday the Germans will realize that nobody needs 18 different combinations of drive settings, certainly not in an SUV. But if Audi and BMW have it, well, that’s just keeping up with the Schmidts.

The real head-scratcher comes in the form of the GLE450 AMG 4MATIC Coupe, one of the first cars in the AMG Sport line that sits between regular Benzes and full AMG battlewagons (think: Audi S or BMW M Sport). Two turbos allow its 3.0-liter V-6 to make 362 horsepower and 384 pound-feet of torque, which is a lot less than the real hand-made AMG V-8 but not enough to make this V-6 feel completely unburdened by the GLE’s tonnage.

The issue goes beyond just a power deficit; the V-6 is also saddled with a nine-speed automatic, which has to do a lot of shifting to keep up appearances. Ultimately, though, it’s the exhaust, a sibilant shriek under acceleration and a drone at cruising speed, that most mars the GLE450 experience. This is the byproduct of a system that pipes in extra bawl-boom through the stereo. It is as unconvincing as the little AMG badges on the GLE450’s fenders. The “real” AMG, the GLE63 S, does without; it doesn’t need it.

All this niche slicing and rebadging and theater leaves us fondly remembering the old ML550, whose 402-hp, 4.7-liter twin-turbo V-8 was worthy of Affalterbach.

cars. ZEV states get a plug-in-hybrid S-class sedan for 2016, the S550e, with 436 horsepower and 479 pound-feet of torque. Its twin-turbocharged 3.0-liter V-6 is teamed with a seven-speed automatic and a 114-hp electric motor that can deliver up to 20 miles of all-electric driving. More exciting is that a droptop S-class coupe should be coming next year.

SL-class: The two-seater sees a 20-hp bump in the SL550 model, from 429 horsepower to 449. A new Mille Miglia edition is limited to 400 cosmetically enhanced units, sure to delight the 400 cosmetically enhanced people who will be driving them.

SLK-class: The base model gets a more powerful engine and a new designation: SLK300. This turbo four, borrowed from the C-class, delivers 241 horsepower and 273 pound-feet of torque and is available only with a nine-speed automatic. That's right, folks, Mercedes no longer offers a manual trans in its U.S. cars.

Minor trim changes: CLA-class, E-class, GLA-class, Sprinter

Unchanged: B-class, GL-class

Dead: SLS AMG

Mini Clubman



Mini

Clubman: The mid-size wagonoid from BMW's small-car subsidiary arrives early next year, featuring a turbo 1.5-liter three-cylinder engine in the Cooper model and a 2.0-liter turbo four in the Cooper S. It's 17.2 inches longer than the most minuscule Mini, the Cooper Hardtop. The Clubman continues the last gen's country-door design with twin half-doors in back, while adopting the Hardtop model's shocked facial expression.

Convertible: While the Roadster's gone the way of the dodo, we expect to see a version of the four-seat droptop on the current Hardtop platform by early 2016.

Minor trim changes: Cooper Hardtop, Countryman, Paceman

Dead: Coupe, Roadster

Mitsubishi

Outlander: Mitsubishi rejiggered its seven-passenger ute inside and out with new fascias and a dressed-up interior. A carry-over 224-hp 3.0-liter V-6 and a six-speed automatic transmission are standard in GT trim. All other versions sport a 166-hp 2.4-liter four-cylinder with a CVT. Four-wheel drive is standard with the V-6 and optional with the four-cylinder.

Minor trim changes:

i-MiEV, Lancer, Outlander Sport

Dead: Lancer Evolution, Mirage (for one year, until the 2017 model arrives)

Nissan

Altima: Nissan's entry in the competitive mid-size-sedan segment is due for a major face lift. Don't expect any powertrain

changes, but the exterior will be reworked to match the styling themes laid down by the new Maxima. The interior will also come in for a restyling. And we expect some chassis updates aimed at improving ride and handling. It goes on sale in November.

Armada: A new version of the big body-on-frame SUV is on its way, based on the freshly introduced Titan pickup truck. While it focuses on getting the Titan right, Nissan might skip a model year of the Armada and launch the new one next year as a 2017 model.

GT-R: A 45th Anniversary Gold Edition GT-R arrives to honor Godzilla's 45th year of production. Based on the GT-R Premium, the package includes a gold exterior and other golden bits. Less than 30 examples will be built. GT-R Premium models get new 20-spoke wheels, and the GT-R Black Edition and GT-R NISMO return to continue their reign of tech-fueled terror.

Leaf: Nissan hasn't announced it yet, but we expect that its

electric car will get a slightly-larger-capacity battery pack for 2016.

Maxima: see test, page 102

Sentra: The mini-Altima will, like the Altima, get restyled for 2016, presumably to look more like the 2016 Altima, which is going to look more like the Maxima. We expect no engine changes.

Titan: New for '16, the Titan is now hitting showrooms. Befitting its name, the first Titans are the extra-strength Titan XD's with the 5.0-liter Cummins turbo-diesel. Gasoline V-6 and V-8 models, as well as a lighter-duty version, are scheduled to arrive soon.

370Z/370Z NISMO:

A new Bose audio system includes active noise cancellation and Active Sound Enhancement to modify the car's exhaust note.

Minor trim changes:

Juke, Pathfinder, Rogue, Versa/Note

Unchanged: Frontier, Murano, NV200, NV2500/3500, Quest, 370Z roadster

Dead: Pathfinder hybrid, Rogue Select, Xterra

Nissan Titan XD



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TESTED

QUIET STORM

THE NEW **NISSAN MAXIMA** IS
FAST ENOUGH, BUT THIS ONE'S
MORE 4DLC THAN 4DSC.

by **Tony Quiroga**

PHOTOGRAPHY BY JESSICA LYNN WALKER

Our culture is currently grappling with questions of identity, the ability to change ourselves. So what, you may ask, does that have to do with the new Nissan Maxima? This is a sedan that has long claimed (without much credibility) to be a four-door sports car, or 4DSC in Nissanese. As far as automotive identity crises go, this is the one to have. We'd love to get a sports car trapped in a four-door body, but that's easier said than done.

Much of the Maxima's spec sheet reads as if it comes from a family sedan. It has a transversely mounted engine, front-wheel drive, and a continuously variable transmission. These are hardly the physical attributes of a sports sedan, let alone a sports car. And yet, nothing on the spec sheet would matter if the Maxima transcended these parts to deliver a sporting driving experience. It doesn't.

Our test car's SR trim is the Maxima at its most athletic. The 19-inch wheels are an inch larger than on other models, and the springs, anti-roll bars, and shocks are all retuned. Nearly all SR models come with 245/40 Goodyear Eagle F1 Asymmetric All-Season tires developed for this application, but our test car came equipped with like-sized Bridgestone Potenza RE050A summer tires. That is stickier rubber, available only as a dealer-installed accessory. So, cheater tires, sort of.

The SR's ride is more sensitive to the road than the luxurious Platinum trim level we also drove, and those summer tires hold to the skidpad with 0.87 g worth of grip. That's a respectable achievement for a mid-size sedan, but it's not something we'd call sports-car, or even sports-sedan, worthy. Let's put skidpad grip aside; it's just a number, after all. What's really bothering us is that the Maxima isn't much fun.

Great sports sedans are instruments of joy when you give them the whip. Switching the SR's Drive Mode Selector to sport enhances the throttle sensitivity, changes the transmission's shifting strategy, raises steering effort, and then lets in more of the engine note. None of that overcomes the dynamic handicap that is born of having 61.4 percent of the mass carried by the front tires. Lay into the Maxima on a road like California's Angeles Crest Highway and, despite excellent body control, this sedan never comes alive, it just understeers—inescapable, grinding, shuddering understeer. The solution is to slow down. But sports sedans shouldn't ask for a breather.

It turns out, though, that the Maxima is actually a credible luxury car. The front and rear seats are spacious and soothingly comfortable. Touches of fake suede, diamond-patterned stitching, and metallic trim are welcome embellishments. At night, ambient lighting subtly illuminates the instrument-panel trim and doors. The simple and elegant round gauges have a seven-inch multi-colored screen between them to display information and route guidance (navigation is standard on all Maximas). An eight-inch touch screen on the

SPECIFICATIONS

VEHICLE TYPE
FRONT-ENGINE,
FRONT-WHEEL-DRIVE,
5-PASSENGER,
4-DOOR SEDAN
PRICE AS TESTED
\$38,945
BASE PRICE
\$38,495
ENGINE TYPE
DOHC 24-VALVE V-6,
ALUMINUM BLOCK AND
HEADS, PORT FUEL
INJECTION
DISPLACEMENT
213 CU IN, 3498 CC
POWER
300 HP @ 6400 RPM
TORQUE
261 LB-FT @ 4400 RPM
TRANSMISSION
CONTINUOUSLY VARIABLE
AUTOMATIC WITH
MANUAL SHIFTING MODE
DIMENSIONS
WHEELBASE: 109.3 IN
LENGTH: 192.8 IN
WIDTH: 73.2 IN
HEIGHT: 56.5 IN
PASSENGER VOLUME
98 CU FT
CARGO VOLUME: 14 CU FT
CURB WEIGHT: 3545 LB

C/D TEST RESULTS

ZERO TO 60 MPH
5.9 SEC
ZERO TO 100 MPH
14.1 SEC
ZERO TO 130 MPH
27.3 SEC
**ROLLING START,
5-60 MPH**
6.0 SEC
1/4-MILE
14.4 SEC @ 101 MPH
**TOP SPEED (GOVERNOR
LIMITED, C/D EST)**
135 MPH
BRAKING, 70-0 MPH
168 FT
**ROADHOLDING,
300-FT-DIA SKIDPAD**
0.87 G
FUEL ECONOMY
EPA CITY/HWY
22/30 MPG
C/D OBSERVED
18 MPG





driver-oriented center console can be also be controlled by the knob behind the shifter. It's quiet inside, too. At a steady 70 mph we measured 66 decibels, and a full-throttle whack only produces 74 dBA. Indeed, it's quieter than the Mercedes-Benz S550, the epitome of luxury.

Nissan clearly worked on turning down the volume on its mainstay V-6. To combat the big six's former predilection to buzz like the coffee grinder at Starbucks, there is a new oil pan to stiffen the bottom of the block. A Bose noise-cancelling audio system and acoustically laminated windshield glass and front windows work to mute other errant sounds that might reach the cabin.

According to Nissan, 61 percent of the V-6's parts are redesigned. Among them are the valves and the intake manifold. From those new parts comes a boost of 10 horsepower for a total of 300. We're a bit surprised at the lack of direct injection, but the V-6 doesn't need it to return 22 mpg city and 30 highway in the EPA cycle. We achieved only 18 mpg, but that included a demanding strafe over the San Gabriel Mountains.

The revised engine isn't just quiet and efficient, it's also able to move the relatively light 3545-pound SR from zero to 60 mph in 5.9 seconds. But again, speed alone does not a sports sedan make. Accelerate at normal traffic pace and the transmission provides a smooth stream of calm progress. With a strong 261 pound-feet of torque there is enough grunt at low rpm that the CVT doesn't have to rev the engine mercilessly.

Nissan has programmed the transmission to act like a conventional automatic, shifting through preset ratios when the accelerator is held beyond three-eighths of its travel. But despite the programming, a more efficient



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chain, and lower-viscosity oil, every big hit of the throttle results in a delay of power delivery as the engine feels like it has to churn up the transmission's butter before providing acceleration. Even CVTs that pretend to have gears aren't sporty.

We actually preferred the slightly softer Platinum trim level to this SR. Without the latter's sporting pretensions, the Maxima comes across as sophisticated, luxurious, and refined. On 18-inch wheels and the non-SR chassis, the Maxima is still taut for its class, but the ride remains relaxed. So while the adjective sport may not apply here, the adjective luxury definitely does. Asking the Maxima to be a sports sedan is like asking Caitlyn Jenner to get back into her decathlon shorts. It just ain't gonna happen.

Porsche Boxster Spyder



Porsche

Boxster: Not to be left sucking the Cayman GT4's wake, the Spyder trim returns to the Boxster lineup bearing a 3.8-liter flat-six good for 375 horsepower. The minimalist top of the previous Spyder is gone in the current 981 gen; a conventional manual-folding top subs in. It's not as light as the old Spyder's canvas bikini, but it does save pounds over a power top. The Boxster Spyder shares the ball-jointed, GT3-derived suspension with the Cayman GT4, and, like the GT4, comes exclusively with a six-speed manual and 911 brake hardware.

Cayenne: The second-generation Cayenne's face lift—which started in 2015 with the diesel, S, and S E-Hybrid models—gets applied to the rest of the lineup (GTS, Turbo, Turbo S). A 440-horse version of the S's 420-hp twin-turbo 3.6-liter V-6 powers the firmly sprung GTS, while the Turbo's 520-hp V-8 is jacked to 570 for the new Turbo S. Along with the cosmetic

changes, all Cayennes receive some chassis tweaks formerly reserved for the Turbo, slightly closing the dynamic gap across Porsche's bestselling vehicle line.

Cayman: Think of the new Cayman GT4 as Stuttgart's answer to the Camaro Z/28 and Mustang Shelby GT350. Or as the most capable sub-911 Porsche, ever. The starting bid of \$85,595 gets you a 385-hp flat-six, a manual trans, and a chassis tuned for road courses, not coarse roads. Don't wait too long; word is the '16 allotment is already accounted for in overseas markets.

911: With the addition of the 500-hp GT3 RS and the Targa 4 GTS this year, there are now 21 varieties of 911.

If you can't find something in this lineup that'll make you smile, put this magazine down and pick up that *Us Weekly* across the waiting room. The RS is a dedicated track car with a license plate. It packs Porsche's equivalent of a big-block flat-six—four whole screaming liters!—in a rear-drive Turbo body. Redline: 8800 rpm. Elsewhere, the Targa 4 GTS blends the four-wheel-drive, power-folding Targa shell with the GTS's 430-hp 3.8-liter. (On paper, the GTS models are bargains because all their standard equipment would add up to a pricier car if fitted to an S model.) At the Frankfurt auto show this month, Porsche will unveil the 991 refresh for 2017. Along with styling

tweaks, the base and S models will get new turbocharged flat-sixes that, not surprisingly, make less power than the big-t Turbo. So, if you want a naturally aspirated 911 and don't want to pony up for a GT model, get a 2016. The lowercase-t turbos should be here by this time next year.

Minor trim changes:

Macan

Unchanged: Panamera
Gone, but not forgotten: 918 Spyder

Ram

ProMaster: RV and shuttle conversions of Ram's full-size cargo hauler get flashier chrome grilles, and the largest, high-roof configuration is now available with windows for proper party-bus duty. All ProMasters

benefit from improved electrical performance for upfitters, including a second battery at the rear of the cab and more auxiliary switches on the dash.

1500: In addition to a new center-console layout, minor trim changes, and small tweaks to its frame for improved crash performance, the Ram 1500 adds the Laramie Limited and Rebel trims to a range that already has such manly names as Lone Star, Big Horn, and Outdoorsman. Both of the new trims made their debuts this summer on 2015 models, and both feature bold "RAM" lettering across their revised grilles. The Limited takes the high road with premium accents, all-black leather upholstery, real wood trim, and other luxuries. Geared more for dirt, the Rebel includes 33-inch off-road tires, rugged cabin detailing, and the requisite skid plates and tow hooks. While not as capable as the heavy-duty

Ram 1500 Rebel



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Scion iA



Power Wagon, the Rebel still looks the part with a bold, monochromatic mien and black trim and fender flares.

2500/3500 Heavy

Duty: Models equipped with the 385-hp, 6.7-liter Cummins diesel get boosted up to 900 pound-feet of torque, as well as increased tow ratings up to 31,210 pounds. As with the 1500 lineup, the Heavy Duty pickups receive minor trim changes, a new center console, and a range-topping Laramie Limited model.

Minor trim changes:

ProMaster City
Dead: Cargo Van

Rolls-Royce

Dawn: A new softtop convertible (make that drophead coupé) version of the Wraith gets revealed this month. Expect the

same gorgeous exterior as the Wraith shorn of its fastback roof, plus a sumptuous four-seat interior accessed by suicide doors.

Ghost: Automatically folding mirrors are standard. Oak veneer replaces elm dash trim.

Phantom: The starlight headliner—an essential \$12,500 option—now provides a lovely twinkling effect. Extended-wheelbase models now include adjustable calf- and footrests for rear-seat passengers. Oak replaces elm here, too.

Wraith: Massaging front seats and adaptive headlamps become standard. Elm replaces oak. In R-R land, these are no minor trim changes.

Scion

iA: One needn't even strip away this tiny sedan's Scion badges or pop off its mad-grouper face to ascertain that this is not, in fact, a Scion. It isn't even something borrowed from Scion's parent brand, Toyota. No, the iA is 100 percent a Mazda 2 sedan—a Mazda that won't be sold here, except, y'know, as a Scion. Billed as the brand's first-ever four-door, the iA comes in a single spec with 16-inch aluminum wheels, forward-collision warning, air conditioning, cruise control, a backup camera, a seven-inch central display, and a 1.5-liter four-cylinder making 106 horsepower, all for

around \$16K. Given Mazda's recent product excellence, the iA should be a nice piece and the only way to get the new Mazda 2.



iM: In stark contrast to Scion's previous hatchbacks, the new (to Scion, at least), iM appears as though it's trying to be an actual serious hot hatch. Too bad the only engine choice, a 1.8-liter making 137 horsepower, drags down the iM's apparent intentions like a rock in a bag of puppies. Still, the iM is essentially cribbed from the European-market Toyota Auris, meaning it could surprise and delight with sprightly handling and a tight structure. Or the rest of it will follow the unimpressive engine's lead and just keep sinking toward the bottom, gravity doing the merciful work.

Minor trim changes:

FR-S, tC

Dead: iQ, xB

Smart

Fortwo: The new Fortwo is the only honest-to-foie-gras French car sold on U.S. soil (it's made in France and is closely related to the Renault Twingo). A turbo helps its 0.9-liter inline-three make 19 more horsepower and 32 pound-feet more torque than the old triple, for 89 and 100, respectively. The agonizingly slow single-clutch automatic is replaced by a quicker dual-clutch, and, for the first time in the U.S., it's joined by a surprisingly pleasant five-speed manual. At 106.1 inches long, the Smart is still nearly four feet shorter than a Mini Cooper Hardtop, and barely four inches longer than a Harley-Davidson Electra Glide. But it's also four inches wider than the outgoing car, finally allowing two adult humans to sit inside without touching in a Duggarly fashion. Expect fuel economy approaching 40 mpg on the highway and a base price around \$15,000.

Smart Fortwo



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Subaru

Minor trim changes:

Legacy, Outback, WRX, WRX STI, XV Crosstrek

Unchanged: BRZ, Forester, Impreza

Tesla

Model S: Because buying a Tesla is akin to joining a cult, updates to these vehicles do not come with a typical fall model-year changeover, but rather whenever the company decides to wirelessly beam the new stuff to your car. Earlier this year, a navigation update to “end range anxiety” offered better mileage estimation and a supercharger-locating trip planner. The company also reconfigured the Model S range, bumping the 60-kWh battery pack of the entry model to 70 kWh and adding a second motor and four-wheel drive. It introduced “Autopilot,” a sensor system that enables adaptive cruise, lane keeping with automatic steering, and self-parking. What

2016 has in store for the Model S will likely depend on Tesla’s myriad other projects, from its Powerwall home battery to the launch of the long-awaited Model X.

Model X: When, in our 2014 New Cars issue, we first wrote about this electric crossover, it had been promised by late 2014. When we wrote about it a year later, its “falcon wing” doors had pushed production back to mid-2015. As we have now reached that point in time, perhaps we might just list the Model X as “unchanged,” which is to say, still delayed. But Tesla maintains it will be ready this month; prototypes spotted on California roads would seem to satisfy the Sagan Standard, which holds that “extraordinary claims require extraordinary evidence.”

Toyota

Land Cruiser: Toyota, master of the heavy refresh, has applied relative restraint in updating the venerable

Land Cruiser. Sheetmetal changes are limited to everything forward of the A-pillars, while additional active and passive safety features and their myriad acronyms append to the SUV’s options list.

Mirai: see test, page 110

Prius: An all-new Prius steps bravely into an America where buyers have once again forgotten about fuel prices, tearing back to pickups and light trucks as if they come with a year’s worth of free Chipotle. So it is little wonder that a four-wheel-drive variant is rumored to be in the works. Still more or less tadpole-

shaped, the standard front-drive Prius sits on the new Toyota New Global Architecture compact-car platform, shedding mass by incorporating more lightweight materials. Toyota will offer buyers two battery options; one is a cost-effective but lower-tech nickel-metal-hydride unit, the other a higher-capacity lithium-ion piece. The plug-in model, with a greater electric-only driving range, will follow the regular Prius by about a year, meaning that for 2016, no such model will exist in the Toyotasphere. And what about the car’s all-important EPA fuel-economy ratings? We hear they could

rise by nearly 10 percent, further elevating the already-impressive 50-mpg-combined rating.

RAV4: In addition to a minor refresh, Toyota’s original crossover also gains a hybrid variant. It borrows its hybrid parts from the four-wheel-drive Lexus NX300h, which borrows its underlying platform from, ahem, the humble RAV4. A 2.5-liter Atkinson-cycle four-cylinder engine mates to an electric motor to power the front axle, while a second electric motor makes the rear axle turn. Only the mid-grade XLE and range-topping Limited RAV4 models will offer

Toyota RAV4



Tesla Model X





the hybrid option, which is expected to get around 30 highway mpg. As for the regular RAV4, it gets updated front and rear fascias, squishier cabin materials, improved noise insulation, and a new sporty SE model with paddle shifters.

Tacoma: The small pickup affectionately known as the Taco has been stirred from a uniquely successful decade-long coma. A sales leader in the less-than-full-size pickup market, the Tacoma has nonetheless soldiered on without major revision since 2004. But this year, perhaps spurred by GM's reborn Chevrolet Colorado/GMC Canyon trucks, Toyota has reheated the Taco. While the general look and taste remain familiar, many body panels are new. Also, the expanded use of high-strength steel improves the Taco's crunch, er, crash worthiness, and a new suspension tune provides greater travel and a more comfortable ride than before. Indicative of the Tacoma's dotage, the 2016 model's Corolla-like interior actually marks an improvement. An ancient 2.7-liter four-cylinder and a five-speed manual remain standard, but the optional 4.0-liter V-6 has been dropped in favor of Toyota's corporate 3.5-liter V-6. The larger engine can be paired with either a six-speed manual or a six-speed automatic, and it is the first U.S.-market Toyota-branded product to be fitted with the D-4S port- and direct-injection fuel-delivery system.

Minor trim changes: Avalon/hybrid, Camry/hybrid, Corolla, Prius c, Sienna, Tundra, 4Runner

Unchanged: Highlander/hybrid, Prius v, Sequoia, Yaris

Dead: Prius plug-in, Venza

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by **Don Sherman**

PHOTOGRAPHY BY SEAN RICE

Mirai is Japanese for “the future.” This is Toyota’s way of saying that its sedan most resembling SpongeBob SquarePants on a skateboard runs on hydrogen and produces no emissions. The Mirai is the first fuel-cell car offered for sale, not just lease. (The conceptually similar Honda FCX Clarity and Hyundai Tucson FCEV remain corporate property through and after the duration of their leases.) The standard rap on fuel-cell vehicles—that the technology is

always five years away—expires when eight California dealers deliver 200 Mirais before the end of the year, followed by another 2800 cars over the next two years. The \$58,325 base price isn’t much of a return on the 23 years of development and 5680 patents that Toyota invested in this future, but milestones never come cheap.

To test not only the Mirai but also the first phase of infrastructure that supports it, we visited hydrogen filling stations in the greater Los Angeles region and drove north to the Mojave Desert for performance measurements. Toyota engineer, future thinker, and fuel-cell authority Jackie Bird-sall served as chaperone and tour guide without whining about our preemptive range anxiety, barrage of tech questions, or blind-curve photographic maneuvers.

Versus the 10,000 or so gasoline stations in California, early adopters will have no more than 20 locations throughout the state to refuel their Mirais. We began our L.A. Basin infrastructure

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TO 10,000 PSI,
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OF GASOLINE’S ENERGY
CONTENT.



assessment by topping off the Mirai's two hydrogen tanks at a Shell station conveniently located across the street from Toyota's Torrance, California, headquarters. Hydrogen delivered at 10,000 psi gave us an indicated 270 miles of range. This station is fed by an Air Products pipeline that has served nearby oil refineries for 20 years.

Operating the filler nozzle takes patience and a firm grip; push in smartly, yank to verify a secure connection, then squeeze and latch the handle to meter. Birdsall's coaching helped. To increase its density, the hydrogen gas is chilled to just above 0 degrees Fahrenheit. Though the nozzle drips with condensation, it's not cold to the touch.

Before our side trip for testing, we topped off at a municipal services yard in Burbank, home to Disney, Warner Bros., and many classic TV shows. This pump was hidden, but once we located it and entered Birdsall's secret free-fuel codes, our tanks were full in four minutes, resetting the range display to a healthy 270 miles.

The Mirai is at home in the L.A. sprawl. It's comfortable, isolation-chamber quiet, and a pleasant means of enduring clotted freeways. Taking advantage of this car's eligibility for the city's high-occupancy-vehicle lanes, we cruised at the speed limit past the creeping CO₂ producers.

While the Mirai's ability to reach 60 mph in 9.4 seconds and 80 mph in the quarter-mile is adequate to keep up with the Priuses and pool cleaners' pickups, it's unlikely to accelerate any enthusiast's heart. When you nail the right pedal, there's a gentle moan and the nose rises eagerly, providing a false sense of acceleration. But with only 152 horsepower propelling a Camry-sized car weighing more than two tons, this is no Tesla.

SPECIFICATIONS

VEHICLE TYPE
FRONT-MOTOR, FRONT-WHEEL-DRIVE,
4-PASSENGER, 4-DOOR
SEDAN
PRICE AS TESTED
\$58,325
BASE PRICE
\$58,325
MOTOR TYPE
SYNCHRONOUS AC, 152 HP,
247 LB-FT
FUEL-CELL STACK
SOLID POLYMER
ELECTROLYTE, 153 HP
TRANSMISSION
1-SPEED DIRECT DRIVE
DIMENSIONS
WHEELBASE: 109.4 IN
LENGTH: 92.5 IN
WIDTH: 71.5 IN
HEIGHT: 60.4 IN
CARGO VOLUME: 3 CU FT
CURB WEIGHT (EST)
4100 LB

C/D TEST RESULTS

ZERO TO 60 MPH
9.4 SEC
ZERO TO 100 MPH
34.2 SEC
1/4-MILE
17.2 SEC @ 80 MPH
TOP GEAR, 30-50 MPH
3.9 SEC
TOP GEAR, 50-70 MPH
6.3 SEC
TOP SPEED
(DRAG LIMITED)
108 MPH
BRAKING, 70-0 MPH
194 FT
FUEL ECONOMY
EPA CITY/HWY
67/67 MPG_e
C/D OBSERVED
57 MPG_e



THE MIRAI'S CABIN IS LESS CAMRY, MORE STARSHIP ENTERPRISE. BUT IT'S SELF-CONSCIOUSLY FUTURISTIC; THE CAPACITIVE-TOUCH INFO DISPLAYS ARE RELATIVELY CONVENTIONAL, JUST BROKEN UP ONTO THREE SCREENS. BOTTOM: THE FILLER NEEDS A HARD SHOVE TO MATE WITH THE MIRAI.



Other character traits are more satisfying: Michelin Primacy MXV4 215/35R-17 tires and a nicely tuned suspension deliver crisp steering response. Little of L.A.'s pavement ripple reaches the driver's seat, and body roll is well damped. The Mirai stops from 70 mph in 194 feet, only three feet longer than the last Prius we tested.

Pumps at the South Coast Air Quality Management District headquarters in Diamond Bar meter hydrogen cooled to -40 degrees F with sufficient accuracy that they can charge credit-card holders \$13.99 per kilogram (\$6.35/pound). We need 0.664 kilogram (1.46 pounds) of hydrogen to fill the tanks, for a total cost of \$9.29.

Near Newport Beach's Fashion Island shopping mall, a sparkling Shell station's pumps were closed for updates. Moving on, we raced a gorgeous Porsche 912 from a stoplight . . . and won. At the next light, we offered a rematch. After calling the Mirai ugly, the Porsche driver declined with the excuse that he had only 60 horsepower on tap.

Pumps at the University of California's National Fuel Cell Research Center in Irvine and at the Orange County Sanitation District in Fountain Valley were also down, awaiting investment funds. That didn't curb Birdsell's enthusiasm for the latter facility's technology. Instead of using the more common method of producing hydrogen through steam reformation of methane, Fountain Valley employs a fuel cell itself to process sewage

▲ SHERMAN AND BIRDSALL CHAT OVER A REFRESHING CUP OF WATER COLLECTED STRAIGHT FROM THE MIRAI'S TAILPIPE. TRY THAT WITH AN AVENTADOR SV.

into heat, electricity, and hydrogen fuel.

Our last stop was at a Chevron station in Harbor City, so named because of its proximity to L.A.'s bustling port. The station dispenses not only hydrogen but also gasoline, diesel, and a wealth of jerky snacks and sugary beverages, thus making it the most normal-looking station on our tour.

In two days, we stopped nine times at seven locations to draw hydrogen from four working pumps, never experiencing range anxiety. Over 400 miles we averaged 56 miles per kilogram of hydrogen, or 57 MPGe, costing us roughly \$0.25 per mile—nearly four times the cost of driving a Toyota Camry hybrid. However, the pioneering Mirai owners will fuel their cars for free using access cards or codes provided by Toyota for three years; perhaps by then Toyota, Shell, and L.A.'s air-quality boosters will have completed their hydrogen-infrastructure upgrades.

No champagne was consumed toasting the Mirai's maiden voyage. Instead, we held a cup under the rear of the car to collect water exiting the fuel cell. Three who sipped that Kool-Aid found no hint of chicory, sultry overtone, or oaky aftertaste. Just flat, flavorless water, as Mother Nature intended.

FUEL-CELL MILESTONES

1839: WILLIAM GROVES' "GAS BATTERY" PRODUCES AN ELECTRIC CURRENT WHEN HYDROGEN AND OXYGEN PASS OVER A PLATINUM CATALYST.

1937: HINDENBURG CATASTROPHE (FOLLOWED BY THERMONUCLEAR WEAPONS IN 1952) MAKES HYDROGEN ONE OF THE MOST FEARED ELEMENTS ON THE PERIODIC TABLE.

1959: FIRST PRACTICAL FUEL-CELL-SYSTEM DEMONSTRATION IN ENGLAND.

1961: FUEL CELLS BEGIN PRODUCING ELECTRICITY AND DRINKING WATER ON NASA SPACEFLIGHTS.

1966: GM'S ELECTROVAN IS THE FIRST FUEL-CELL-POWERED VEHICLE.

1968: ARIE JAN HAAGEN-SMIT, THE SCIENTIST WHO IDENTIFIED CAR EXHAUST AS THE CAUSE OF L.A. SMOG, BECOMES THE FIRST CHAIRMAN OF THE CALIFORNIA AIR RESOURCES BOARD (CARB).

1983: GEOFFREY BALLARD COMMENCES FUEL-CELL RESEARCH IN CANADA.

1990: CARB INTRODUCES ITS ZERO-EMISSION-VEHICLE MANDATE.

1992: TOYOTA BEGINS FUEL-CELL RESEARCH.

2002: HONDA LEASES FIVE FCX HATCHBACKS TO THE CITY OF LOS ANGELES. TOYOTA LEASES FUEL-CELL-EQUIPPED HIGHLANDERS HERE AND IN JAPAN.

2005: FUEL-CELL BUSES HIT THE ROAD IN EUROPE, CHINA, AND AUSTRALIA.

2008: CONSUMERS BEGIN LEASING HONDA FCX CLARITYS.

2009: JAPANESE HOMES ARE HEATED AND POWERED BY FUEL CELLS.

2014: THE HYUNDAI TUCSON ix35 FUEL-CELL VEHICLE CAN BE LEASED FOR A \$2999 DOWN PAYMENT AND \$499 PER MONTH, WITH FREE FUEL FOR THREE YEARS.

2015: THE \$58,325 TOYOTA MIRAI IS THE FIRST FUEL-CELL VEHICLE AVAILABLE FOR PURCHASE. FUEL IS FREE FOR THREE YEARS.

2016: SECOND-GEN HONDA FCX CLARITY IS SCHEDULED TO ARRIVE.





Volkswagen Beetle Dune

Volkswagen

Beetle: The second-gen retro bug gets a Baja Bug-inspired Dune model based on the 2014 concept of the same name. The Dune will be available in both coupe and convertible body styles and has slightly wider tracks and two additional inches of ground clearance over the regular Beetle. But the buffed-up look is mostly for show. Small fender flares and faux skid plates within the new bumpers mask what is still just a front-driver. Interior updates include new special accents. Both the 170-hp 1.8T gas engine and VW's latest 2.0-liter TDI diesel, along with manual and automatic gearboxes, will be offered when it goes on sale early next year.

Golf/GTI: All 2016 Volkswagens finally receive USB ports inside. And VW's MIB 2 multimedia system—which integrates Apple CarPlay, Google Android Auto, and MirrorLink connectivity—proliferates throughout the lineup, except for the Tiguan and Touareg utes. New driver-assistance nannies—including adaptive cruise, emergency braking, lane-departure assistance, and more—are now also available on most Golf models (as well as CCs and Jettas). And there will be a six-speed-manual option for the 292-hp Golf R, which is pretty exciting. A new value-laden SE trim also appends to the electric e-Golf model, as does an optional quick-charging package.

Jetta: Along with the addition of VW's latest infotainment suite, a new turbocharged, 1.4-liter TSI four-cylinder arrives, replacing the naturally aspirated 2.0-liter in S models and the 1.8T in the mid-level SE. The known stats are 150 horsepower, 184 pound-feet of torque, and 40 mpg on the highway. Sportier GLI models also gain revised front and rear fascias, as well as an updated instrument cluster.

Passat: VW was short on details when we went to print, but confirms that the Passat will see a significant refresh for 2016 when it goes on sale later this year. Along with revised sheetmetal, wheels, and lighting elements, the freshened Passat will also feature more-upscale interior

trappings, along with a new instrument cluster that integrates additional electronics and safety technologies.

Minor trim changes: CC, Golf SportWagen, Tiguan, Touareg
Unchanged: Eos (set to die a few months into the 2016 model year)

Dead: Touareg hybrid

Volvo

S60: The Chinese auto industry's first sedan for the United States market wears a Volvo badge and is called the S60 Inscription. This long-wheelbase version of the S60 from Volvo's Chinese parent, Geely, offers 3.4 inches of additional rear legroom and comes in two trim levels, Premier and Platinum, with new 19-inch wheels and the

company's 2.0- or 2.5-liter turbo four-cylinders with front- or four-wheel drive. Prices land in the middle of the S60's full range and span \$39,640 to \$44,140.

S90/V90: Born of Geely's \$11 billion investment in Volvo, this new large sedan and hatchback replace the defunct S80 and V70. They're constructed using Volvo's Scalable Product Architecture, which is shared with the new XC90. The car should be larger than the old S80/V70, and interior trimmings are said to be opulent thanks to Volvo's headhunting of Bentley interior designer Robin Page in 2013. Volvo's Drive-E transverse powertrain unit, which is a 2.0-liter four-cylinder augmented by both a supercharger and a turbocharger, will make the thrust with, hopefully, not much thirst, especially in the T8 hybrid version. Two wheelbases will be available at launch later this year, with four-wheel drive possibly the only drivetrain option. Later, a V90 Cross Country should arrive as a replacement for the XC70.

XC90: see road test, page 118

Minor trim changes: V60, XC60, XC70
Dead: S80, V70



Volvo S60



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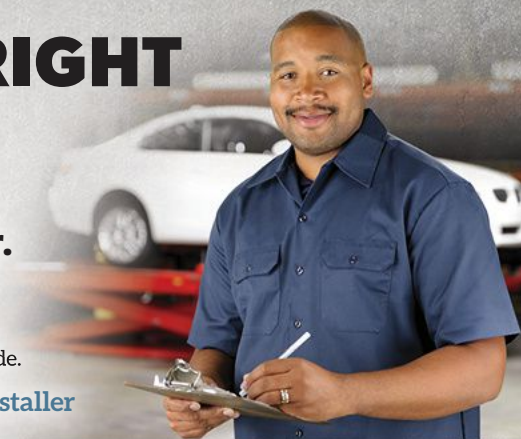
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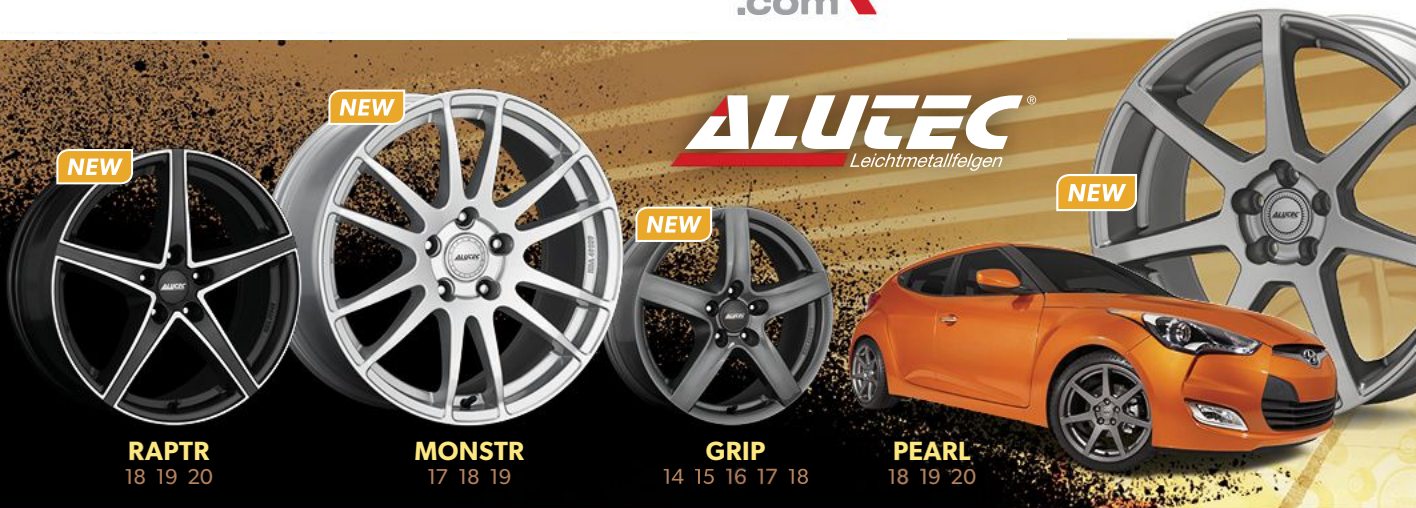
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Avarus AV14
18 20

Starke Design BC
19 for Porsche

Advanti FS Fastoso
18 19 20

ASA GT12
17 18



MSW Type 47
17 18

Axis Model One
20

Bremmer Kraft BR13
17 18

Verde AX
19 20

Verde Saga
17 18 20



Sparco Assetto Gara
14 15 16 17 18

Sparco Assetto Gara
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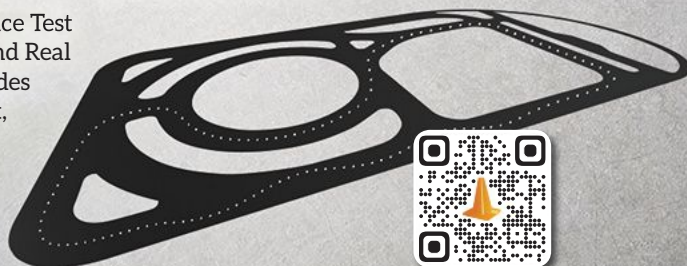
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FORD'S VOODOO V-8

**THE MOST
INTERESTING
ENGINE
OF THE YEAR**

by Mike Sutton

Intake Long intake runners within the plastic manifold contribute to the engine's broad power band, as do a gaping, 87-millimeter throttle body and a large-volume air filter.

Block The reinforced aluminum block has the same bore spacing and deck height as the 5.0, but 94-by-93-millimeter bore-and-stroke dimensions yield 5163 cubic centimeters (or 315 cubic inches) of displacement. Voodoo's larger bores necessitate plasma-transferred wire-arc cylinder surfaces instead of Coyote's iron liners.

Heads Ford optimized the aluminum 32-valve top end for high-rpm breathing and reduced mass. The hollow steel intake valves and sodium-filled exhaust valves are larger and more widely spaced than the 5.0's, and are actuated by monster camshafts providing 14 millimeters of lift. Ford's Ti-VCT variable valve timing helps manage the 12.0:1 compression ratio.

Fuel Delivery Ford spared the expense and complication of direct injection for this low-volume engine.

Exhaust Short-tube, 4-into-2-into-1 headers inflict minimal backpressure as they plumb the flat crank's heartbeat into the GT350's variable exhaust system. They also allow for closely mounted catalysts that improve cold-start emissions.

Crankshaft The 5.2's connecting rods attach to the flat-plane crank at 180-degree intervals versus a normal V-8's 90 degrees. A carefully tuned crankshaft damper helps manage the vibrations, and holes drilled throughout reduce weight. Both the crank and rods are made of forged steel; the pistons are constructed of forged aluminum.



he new rev-happy 5.2-liter V-8 in the Mustang Shelby GT350 is one of the most compelling reasons to visit a Ford dealership in 2016. Code-named Voodoo and sharing its basic architecture with the Mustang GT's 435-hp, 5.0-liter Coyote engine, this new powerplant is an altogether wilder animal, producing 526 horsepower at 7500 rpm and 429 pound-feet of torque at 4750. Camaro Z/28s, beware.

Voodoo harbors in its belly a flat-plane crankshaft with throws spaced every 180 degrees, like a four-cylinder—and also like a Ferrari V-8. The leaner crankshaft with lighter counterweights has lower rotating inertia than the 5.0-liter and provides evenly spaced exhaust pulses in each bank for better breathing.

Along with greater specific output, the result is a hellacious exhaust note unlike any other American V-8; the fury is Wagnerian as revs build to the 8250-rpm redline.

Ford sweated the 5.2's components to shave a few pounds from the 5.0's mass, and it will assemble the mills by hand at its Romeo, Michigan, engine plant. Its witchcraft V-8 will power the \$49,995 GT350 and the \$63,495 GT350R. Both prices include the Voodoo's \$1300 gas-guzzler tax.

HOW SWEDE IT IS

A CHINESE COMPANY MAY HAVE BOUGHT THE PLACE, BUT THE FIRST GEELY-DEVELOPED VOLVO, THE XC90, IS MORE SWEDISH THAN SKARSGÅRD.

by John Pearley Huffman

PHOTOGRAPHY BY ANTON WATTS



nce upon a time, it seemed as if Sweden and Volvo were destined to rule the world. In 1975, Björn Borg was emerging as the world's dominant tennis player, ABBA had already won the Eurovision Song Contest and was climbing the charts, IKEA's relentless expansion was underway, and Volvo's new 240-series was the industry's most sensible shoebox. The 240 was square and austere, but it glowed with that aura of Swedish democratic socialism that made it irresistible to anyone holding a poli-sci doctorate. The '70s was the decade of Peak Sweden, but that was 40 years ago, and hey, nothing lasts forever.

So here is the new, sweetly handsome, slightly eccentric, even subtly glamorous XC90 intended to return Volvo to the forefront of the progressive automotive consciousness. Ejected by Ford in 2010 in exchange for quick Chinese cash, Volvo is no longer just one more brand leveraging a global behemoth's engineering assets. Propelled by a wad of still more Chinese cash, it's back to being its own Scandinavian thing. And the XC90 three-row crossover is the first expression of this recaptured independence. Volvo is Swedish again. Mostly.

The new XC90 is the first Volvo built using the company's wistfully named Scalable Product Architecture (SPA) that will, eventually, be chopped, channeled, sliced, and massaged to underpin future Volvos of a variety of sizes. There's nothing radical in the SPA's modular engineering or steel unibody structure, but at least there's novelty in the suspension. Forget front struts; the XC90 uses control arms there, and in back there's an independent system that uses a transverse composite leaf spring similar to the Chevy Corvette's. Unless, that is, the vehicle, like our tester, is ordered with \$1800 worth of cushy air springs.

There's also only one engine in Volvo's future: a 2.0-liter, direct-injected, variable-valve-timing twin-cam four-cylinder that Volvo calls Drive-E for some hard-to-explain reason. It comes in various forced-induction flavors, burning either gasoline or diesel. In the T6 AWD Inscription trim we tested, it pairs the turbo with a two-stage supercharging system that employs a belt-driven Roots-style blower at low speed. As revs climb, boost duties get handed off to the turbo. Volvo rates this twin-charger engine at 316 horsepower and 295 pound-feet of torque at 2200 rpm. It's hooked to an Aisin eight-speed automatic transmission, and from there power is distributed to a Haldex four-wheel-drive system.

Extremely compact despite its various blowers, the Drive-E powerplant is lost in the XC90's cavernous engine bay under a black plastic cover. Take off that cover and Volvo could probably stack another couple of Drive-Es in there and still get the hood closed.

A 400-hp hybrid "T8 Twin Engine" model, using the same turbo-supercharged engine with the addition of an electric motor and a battery, will be released later. A turbo-diesel version of the Drive-E engine will be offered in other markets, but not here. At least not yet.

When Detroit luxury meant padded vinyl roofs and tufted velour, Volvo could get away with square-edged styling and simple interior surfaces while still selling itself as a premium product. The new XC90, on the other hand, is the most richly detailed Volvo yet. But it hasn't totally abandoned the conservative, upright stodginess that defines the brand. There's a gentle slope across the hood that tumbles down into the fenders, while the rear fenders flare out to produce ample hips. But that's about it for curvaceousness. The XC90's grille is flat and flanked by headlights that feature, as part of the Inscription package, LED daytime running lamps in a pattern dubbed "Thor's Hammer." So at least the headlights might exist in the Marvel Universe.

Filling the fenders are optional 275/40 Pirelli Scorpion Verde All Season tires wrapped around 21-inch wheels with eight tapered spokes. Despite their diameter, the wheels' restrained design keeps them from visually overwhelming the vehicle. Sticking with the standard 20-inch wheels will save \$750. If, on the other hand, you want to be overwhelmed, 22-inch wheels and tires are part of the "R-Design" trim that is the sportier alternative to the Inscription.

At 194.8 inches long overall, the new XC90 is 5.5 inches longer than the previous version, and its 117.5-inch wheelbase is 4.9 inches greater. That growth moves the XC90 up so that it's now a bit longer (1.6 inches) than a BMW X5 and a lot longer (5.7 inches) than the Mercedes-Benz M-class (rebadged GLE for 2016). A broad-beamed bruiser, it's a few inches wider than its German competitors, too. And this example weighed in at a thick 4733 pounds.

Twist a knob on the center console one way to start the XC90 and the other way to shut it off. While the engine starts when that knob turns, the driver is more likely to be dazzled by the large, lush LCD display that contains the vir-

tual tachometer and speedometer. It should be reconfigurable with different themes, but it isn't. At least the lone layout is beautiful. Mounted in the center console is a nine-inch screen that's slightly larger than an Apple iPad Mini. With different functions grouped in pages that can be swiped from side to side, Volvo's Sensus interface is relatively easy to understand and use. Because an infrared grid detects finger movements across the



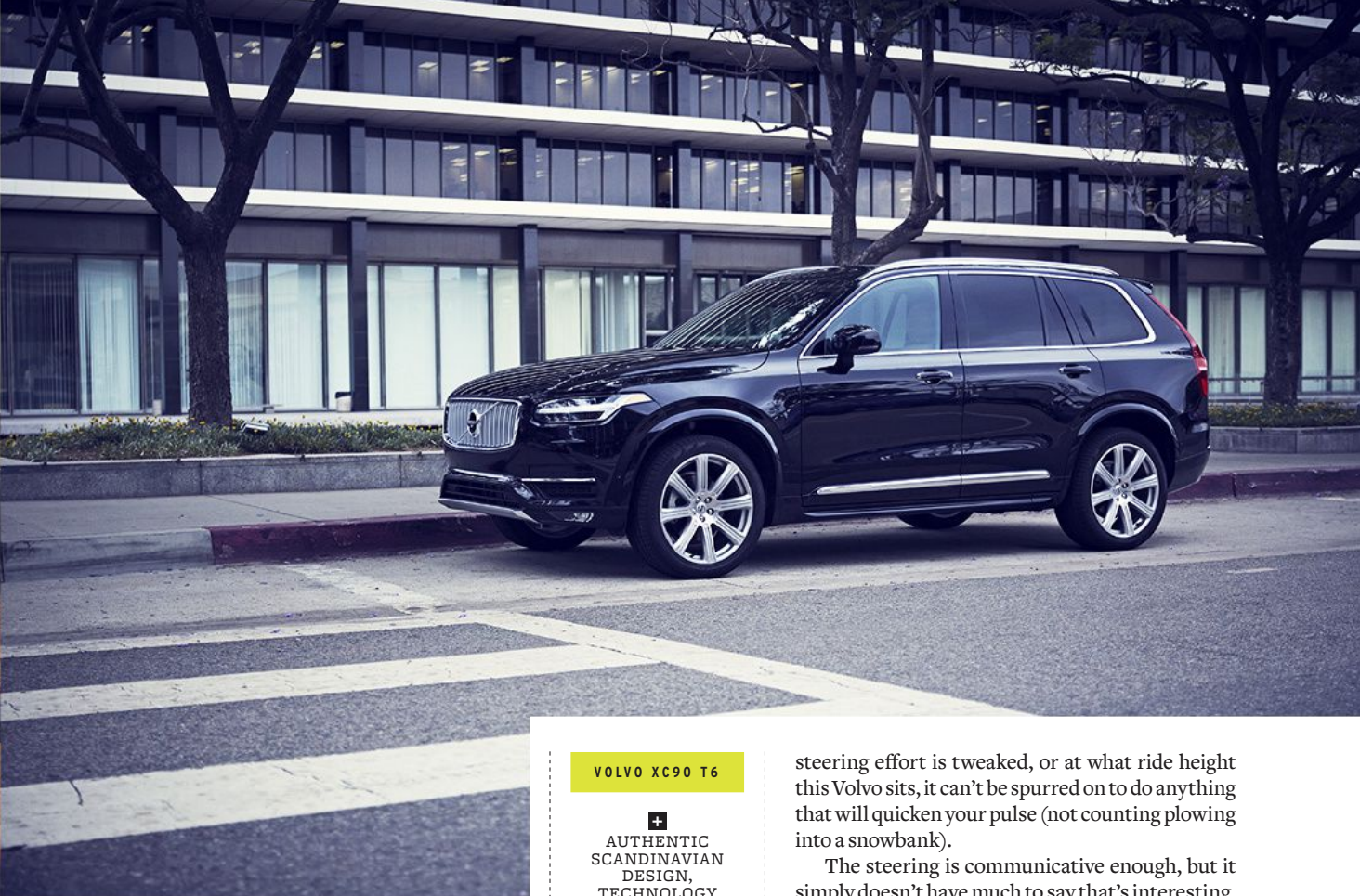
▲ TOP: THE XC90'S SEATS ARE THERAPEUTICALLY COMFORTABLE. ABOVE: KNURLED SELECTOR WHEEL IS TYPICAL OF THE ATTENTION TO DETAIL HERE.

center screen, it can be operated while wearing gloves. How's that for Swedish?

Anticipating adoption of Apple's CarPlay phone-mirroring technology, Volvo has limited connections to a single USB port for jacking portable devices into the system.

While the seats look thin, they're perfectly designed, with bolstering that can be tweaked to fit even the most bizarre automotive-journalist physique. Heating and cooling through the perforated-leather surfaces offers climatic relief.

Snick the short gear selector back into drive and the XC90, despite its prodigious boosted torque, moves forward with a gentle swiftness, as if on ballerina slippers. Even at part-throttle there's a slight supercharger whine as the engine builds steam. The eight-speed transmission shifts often to keep those revs low, but the shifts themselves are unobtrusive and gentle. Like every current turbo car, the XC90's electronic brains are obsessed with limiting engine speeds, and that can lead to some hunting and pecking for just the right ratio in traffic. In the XC90, that's only slightly distracting.



VOLVO XC90 T6

+
AUTHENTIC
SCANDINAVIAN
DESIGN,
TECHNOLOGY
INTEGRATED WITH
ELEGANCE, VOLVO'S
CLASSIC MUTE
CHARM.

-
LOW-KEY
PERFORMANCE
FROM A SMALL
ENGINE, HAZY
DRIVER
COMMUNICATION.

=
VOLVO BUILDS A
VOLVO AGAIN.

Under full throttle, the engine uses its forced talent well. Despite the bulk and tiny engine displacement, the XC90 makes the run to 60 mph in a reasonable 6.4 seconds. The last 300-hp, turbocharged six-cylinder BMW X5 xDrive35i we tested did the same feat in 6.0 seconds. What acceleration deficit the Volvo has is likely tied to a lack of low-end torque. While all of the XC90's 295 pound-feet report for duty at 2200 rpm, the X5's 300 pound-feet are all aboard by 1300 rpm. There are advantages to an extra liter of displacement and two more cylinders.

But the pleasantness of the XC90's composed ride, soft reflexes, quiet operation, and beautifully detailed and comfortable cabin are all compensating virtues. On the sheer beauty of the wood and piano-black interior trim alone, nothing else quite matches the XC90's elegance in the crossover world. Beyond that, it's not British, Japanese, German, Korean, or American; the interior positively asserts its calm, restrained Swedishness. It practically makes one crave pickled herring.

People, however, usually resent being crammed into a jar. The XC90's third row provides its occupants with 31.9 inches of legroom. That's 2.7 inches more than what Audi claims for the 2015 Q7's third row. It's even 7.1 inches more than what third-rowers get in a Chevy Tahoe. The Audi and Chevy beat the Volvo in backmost-row shoulder room, but the young fries sentenced to ride there are usually narrow, and their pliable bones can withstand some packing. Plus they're not paying rent, so tell them to shut up and play with their phones.

Put both rows of rear seats down and Volvo says there is 86 cubic feet of storage space aboard. That's 13 cubic feet better than the '15 Q7. Go back to 1982 and the best a 240 wagon offered was 76 cubic feet.

But on the road, looking through the head-up display out past the contours of the hood, it's obvious that the one thing the XC90 can't offer is excitement. No matter what drive mode is selected, no matter how the driver-adjustable

steering effort is tweaked, or at what ride height this Volvo sits, it can't be spurred on to do anything that will quicken your pulse (not counting plowing into a snowbank).

The steering is communicative enough, but it simply doesn't have much to say that's interesting. The brakes haul the vessel down from 70 mph in 184 feet with minimal fade and no drama, but they don't inspire confidence when you're pounding along a favorite back road, trying to aim a little deeper into the apexes. And while we suppose this is true of most non-M-, AMG-, and Porsche-badged SUVs, there simply isn't enough power to think of the accelerator pedal as a source of amusement. There ought to be more sled-pulling grunt. At least with an EPA-rated 20 mpg in the city and 25 mpg on the highway, fuel mileage is pretty good.

At a base price of \$49,895, with the Inscription package adding \$5600 and the 19-speaker Bowers & Wilkins stereo upping the chit another \$2650, our tested XC90 came in at \$65,955. That's not cheap, but it's a significant discount from what the German brands charge for similarly equipped vehicles with only two rows of seating.

Volvo can't go back to the 1970s to recreate what once was. The market has left austerity well behind. But in going back to simplified vehicle platforms with a single family of four-cylinder engines, Volvo has embraced the same smart, uncomplicated efficiency that was a vital part of its past. The XC90 is an attractive package, even if it's not aimed at people enraptured with high performance. And some of that performance may come roaring to us when the T8 Twin Engine appears.

Volvo is what's left of the Swedish automobile industry. The well-executed XC90 indicates that Volvo knows it can't be a pretend-German, an almost-American, or a maybe-Japanese brand. Not if it's going to thrive. Peak Sweden isn't back, but Easygoing Sweden may be in for a long run.

VOLVO XC90 T6 AWD INSCRIPTION

▼ SPECIFICATIONS

PRICE
AS TESTED \$65,955
BASE \$55,495

VEHICLE TYPE: front-engine, 4-wheel-drive, 7-passenger, 4-door hatchback
OPTIONS: Bowers & Wilkins Premium Sound System, \$2650; air springs and Four-C Active Chassis, \$1800; Convenience package, \$1800; Vision package, \$1600; Climate package, \$1050; 21-inch wheels, \$750; Onyx Black Metallic paint, \$560; second-row center booster seat, \$250
STANDARD: power windows, seats, locks, and sunroof; remote locking; cruise control; tilting and telescoping steering wheel; rear wiper
AUDIO SYSTEM: satellite radio, CD player, rear DVD entertainment, USB and Bluetooth-audio inputs, 19 speakers

ENGINE
 turbocharged, supercharged, and intercooled inline-4; aluminum block and head
BORE X STROKE 3.23 x 3.67 in, 82.0 x 93.2 mm
DISPLACEMENT 120 cu in, 1969 cc
COMPRESSION RATIO 10.3:1
FUEL DELIVERY SYSTEM direct injection
TURBOCHARGER Borg Warner
SUPERCHARGER Eaton R410 TVS
MAXIMUM BOOST PRESSURE 20.3 psi
VALVE GEAR: double overhead cams, 4 valves per cylinder, variable intake- and exhaust-valve timing
REDLINE/FUEL CUTOFF 6600/6200 rpm
POWER 316 hp @ 5700 rpm
TORQUE 295 lb-ft @ 2200 rpm

DRIVETRAIN
TRANSMISSION 8-speed automatic with manual shifting mode
FINAL-DRIVE RATIO 3.33:1

4-WHEEL-DRIVE SYSTEM: full time with automatic rear-axle engagement, hill-descent control

GEAR	RATIO	MPH PER 1000 RPM	MAX SPEED IN GEAR (rpm)
1	5.25	4.9	30 mph (6200)
2	3.03	8.5	53 mph (6200)
3	1.95	13.1	81 mph (6200)
4	1.46	17.6	109 mph (6200)
5	1.22	21.3	130 mph (6200)
6	1.00	25.6	132 mph (5100)
7	0.81	31.7	132 mph (4175)
8	0.67	38.1	132 mph (3475)

CHASSIS
 unit construction with a rubber-isolated rear subframe
BODY MATERIAL: steel and aluminum stampings

STEERING
 rack-and-pinion with variable electric power assist
RATIO 16.8:1
URNS LOCK-TO-LOCK 2.9
TURNING CIRCLE CURB-TO-CURB 39.7 ft

SUSPENSION
F: ind, unequal-length control arms, air springs, cockpit-adjustable electronically controlled dampers, anti-roll bar
R: ind; 1 control arm, 1 lateral link, and a toe-control link per side; air springs; cockpit-adjustable electronically controlled dampers; anti-roll bar

★ NOTABLE HIGHLIGHTS

Base XC90s use a transversely mounted composite leaf spring in the rear suspension, just like a Corvette. The turbocharger and supercharger work in concert, occasionally, delivering up to 17.4 psi of boost. The turbo alone delivers the max boost of 20.3 psi.



EXTERIOR DIMENSIONS

WHEELBASE 117.5 in
LENGTH 194.8 in
WIDTH 79.1 in
HEIGHT 69.9 in
FRONT TRACK 65.7 in
REAR TRACK 65.8 in
GROUND CLEARANCE 9.3 in

INTERIOR DIMENSIONS

SAE VOLUME **F:** 53 cu ft
M: 47 cu ft **R:** 31 cu ft
CARGO (SEATS UP/THIRD ROW FOLDED/MAX) 16/42/86 cu ft
PRACTICAL STOWAGE
LENGTH OF PIPE 139.0 in
LARGEST FLAT PANEL, L x W 78.8 x 44.5 in
NO. OF 9 x 11 x 16-IN BOXES, SEATS UP/THIRD-ROW FOLDED/MAX 6/24/51

BRAKES

F: 13.6 x 1.2-in vented disc
R: 12.6 x 0.8-in vented disc

STABILITY CONTROL partially defeatable

WHEELS AND TIRES

WHEEL SIZE/CONSTRUCTION 9.0 x 21 in
TIRES Pirelli Scorpion Verde All Season 275/40R-21 107V M+S

CAR AND DRIVER TEST RESULTS

ACCELERATION

ZERO TO	SECONDS
30 MPH	2.3
40 MPH	3.4
50 MPH	4.7
60 MPH	6.4
70 MPH	8.3
80 MPH	10.5
90 MPH	13.6
100 MPH	17.3
110 MPH	22.4
120 MPH	29.0
ROLLING START, 5-60 MPH	7.4
TOP GEAR, 30-50 MPH	3.4
TOP GEAR, 50-70 MPH	4.7
1/4-MILE	15.0 sec @ 94 mph
TOP SPEED (GOV LTD)	132 mph

■ **TEST NOTES:** The XC90 launches without fanfare. Power builds quickly and with a steadiness that belies the two separate sources of induction pressure. The acceleration, though not blood-stirring, makes it hard to believe there's a 2.0-liter engine under the hood.

HANDLING

ROADHOLDING, 300-FT-DIA SKIDPAD 0.77 g
UNDERSTEER MINIMAL

■ **TEST NOTES:** Soft and secure, the grip on the skidpad feels greater than 0.77 g. A more aggressive set of rubber would allow for much better skidpad performance, but the available grip is usable and safe. Come to think of it, that could be the XC90's motto.

BRAKING, 70-TO-ZERO MPH

FIRST STOP	176 ft
SHORTEST STOP	184 ft
LONGEST STOP	191 ft
FADE RATING	SLIGHT

■ **TEST NOTES:** Distances increased slightly over the six stops, but the brake pedal remained firm. Stops from 120 mph during testing didn't change the brake-pedal feel, either. Strong brakes, but Volvo's choice of rubber keeps the XC90 from posting more-impressive stopping-distance numbers.

WEIGHT

CURB 4733 lb
PER HORSEPOWER 15.0 lb
DISTRIBUTION **F:** 51.7% **R:** 48.3%
TOWING CAPACITY 5000 lb

FUEL

CAPACITY 18.8 gal
OCTANE 91 (required)
EPA CITY/HWY 20/25 mpg
C/D OBSERVED **17 mpg**

INTERIOR SOUND LEVEL

IDLE 47 dBA
FULL THROTTLE 71 dBA
70-MPH CRUISING 67 dBA

tested by TONY QUIROGA
 in California City, California

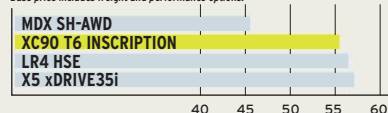


▼ COMPETITORS

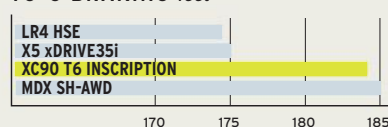
ACURA MDX SH-AWD (3.5-L V-6, 290 HP, 9-SP AUTO)
 BMW X5 xDRIVE35i (3.0-L I-6, 300 HP, 8-SP AUTO)
 LAND ROVER LR4 HSE (3.0-L V-6, 340 HP, 8-SP AUTO)
VOLVO XC90 T6 INSCRIPTION (2.0-L I-4, 316 HP, 8-SP AUTO)

CURRENT BASE PRICE dollars x 1000

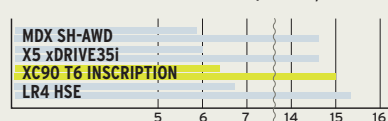
Base price includes freight and performance options.



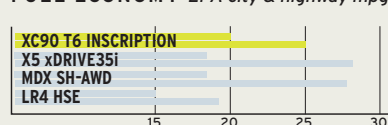
70-0 BRAKING feet



ACCELERATION 0-60 & 1/4-mile, seconds



FUEL ECONOMY EPA city & highway mpg



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WORKLIGHT

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TOOL CART**
US GENERAL

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- Truckin' Magazine

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LOT 68049/62326
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HIGH SPEED STEEL
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WOW SUPER COUPON

**POWDER-FREE NITRILE GLOVES
PACK OF 100**
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LOT 68497/61360
LOT 61359
LOT 68498 shown

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CREEPER**

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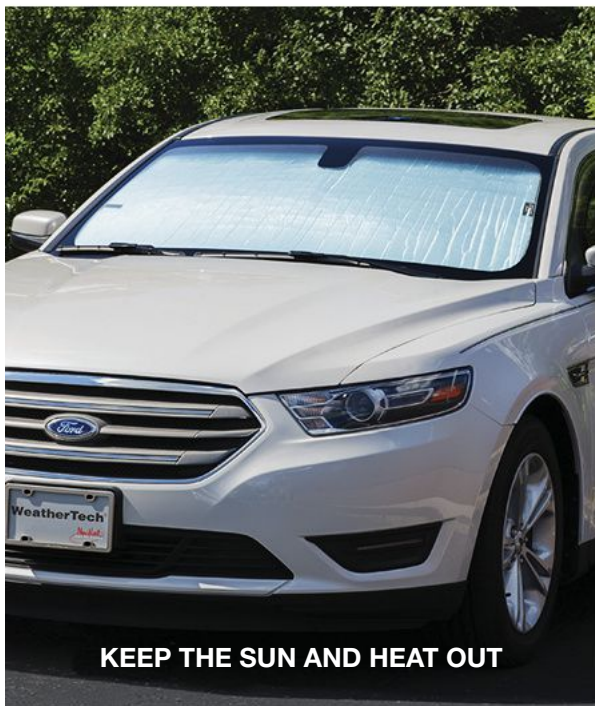


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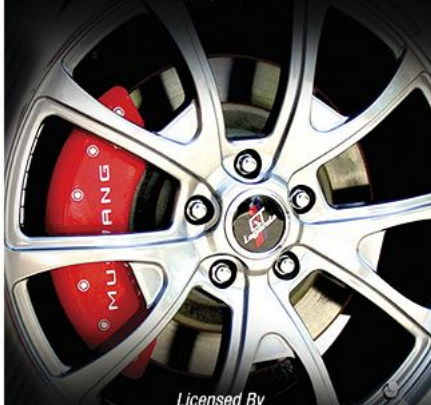
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what i'd do differently ...

128

09.2015

JOHN KRAFCIK

John Krafcik, 54, is an engineer and the former CEO of Hyundai Motor America. In 2014, he joined TrueCar, an online car-buying service, where he is president.

C/D: At Ford you were chief program engineer on the Expedition. Why did you leave?

JK: After the 2003 Expedition launched, I moved back over into a functional role. I got to the point where I didn't aspire to do anything else in the company. This was before Alan Mulally had come in... the culture at the company wasn't a very positive one. I had a headhunter reach out to me for a position running Hyundai's U.S. product and strategic planning.

C/D: You became Hyundai's CEO just as the recession hit in '08.

JK: We knew all we had to do was to get our dealers through a 12-to-18-month period until the new Sonata launched and we would absolutely rock the industry. So we brought our dealers into the tent with us, showed them what was coming. Then we said to them: "We're not going to grow the network. You 800 or so Hyundai dealers? You're the guys we're going to stick with for the next 5 to 10 years. We want to grow volume, but we want to do it with you." We stuck with those dealers.

C/D: TrueCar, the online pricing-and-information service for shoppers that you run now, is being sued by some dealers. They claim false advertising and that TrueCar operates without proper dealer or broker licensing.

JK: It's sort of like if you were Domino's Pizza, Papa John's may not be a friend. Similarly, our TrueCar-certified dealers are competing with non-TrueCar dealers. Consumers are favoring the promise that a TrueCar-certified dealer brings. If you're a non-TrueCar dealer, it's not a good thing. Let's face it, this is a free country, and it's a wonderful thing. Companies and organizations and even trade associations are able to craft lawsuits that may or may not have merit. We believe they have zero merit.

C/D: What's next for you, TrueCar, and cars?

JK: Increasing trust and removing friction in the process will increase the velocity of car purchase. Which moves the world closer to a fractional ownership model... and we're going to be a part of that at TrueCar. So you can have a car for three months or four months or six months—a car that's just right for you at that time. And we're going to make it so easy to make those moves from car to car that it's going to grow the industry.

C/D: I'm suspicious of that. The economic advantages of running a car into the ground over a 15- or 16-year period are overwhelming.

JK: In the end, one of the drivers is going to be technological obsolescence. It's why the industry is so strong today. Comparing a 2015 to a 2005 car, there's maybe never been a more dramatic, important change in 10 years in the level of tech. Something just as simple as Bluetooth. Those changes make it so compelling for the average person owning a car in the fleet—which is an 11-year-old car—to upgrade.



C/D: I disagree there, too. I added Bluetooth to my 16-year-old Toyota Tundra for \$70. And I don't need Wi-Fi or a navigation system because I can do it using my phone.

JK: You bring up good points. The only thing I feel badly about is access to safety technology. Technology that could save your life. Things like electronic stability control, which I'm not sure your Tundra has.

C/D: It doesn't even have ABS.

JK: My God, I'm blessed to be speaking with you. You should be six feet under. I think in the end, both points of view—and they seem like polar opposites—they're both true. There will be transportation services that are liberating for humans. And there's still going to be individual automobile ownership... because there are so many use cases where shared autonomy won't deliver.

C/D: After leaving Hyundai, what did you buy for daily transportation?

JK: I thought deeply about this. I'm a car guy—a total car geek. But there's a certain kind of car that I like. I love high-performance wagons. I ended up with a 2015 Volvo V60 Polestar wagon. My one regret is that I did not get it in Rebel Blue. I got the black one.

C/D: Is there anything you'd do differently?

JK: I regret not buying a Ford GT. I regret not being on the waiting list for one of the new ones. And for sure, I would have bought the Rebel Blue Polestar.

—JOHN PEARLEY HUFFMAN

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